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" Medical Research : (I) Epidemiologic Terminology "

B.S. Gupta

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لن يكون هناك تطور في الطب ما لم يكن هناك بحث علمي جاد ، وهو مسؤولية كل علمي مهني حتى يتأكد من تقدم مهنته بالبحث العلمي ، والذي ستنعكس نتائجه إن عاجلاً أو عاجلاً على الطب التطبيقي . وللبحث العلمي المفيد منهج خاص وطرق مؤكدة وخلفية علمية واسعة مبنية على الاطلاع على نتائج وطرق البحث للآخرين . وحتى يمكن لعدد أكبر من الطبيين بمزاولة البحث العلمي ، رأينا أن نعرض عدة مقالات نشرها في مجلتنا الطبية لتشجيع البحث العلمي الصحيح .

There is no medical progress without scientific medical research. It is the duty of every scientist to further the advancement of his science and profession by such researches, whose results will ultimately find their way in applications that will help the advancement of mankind. However, science is an exact branch of specialized human activity that depends on certain principles and methods and upon a critical evaluation of published literature. This necessitates that those involved in scientific medical research must be acquainted well with the terminology and the accepted methods of such research activity, so that they may be better able to plan, conduct, interpret, and report their researches and evaluate other peoples researches. With this objective in mind, The Garyounis Medical Journal has invited a highly respected epidemiologist, a member of our University's staff, to present a brief but stimulating series on epidemiologic terminology and on conceptualizing epidemiologic research methods, which will be published in this and the coming issues of the Journal.

The Editor

Incidence rate and prevalence rate are two basic measures of disease frequency, which are widely used by researchers. The meaning and concept of these rates is not always clear from the context. This can lead to confusion when comparing different studies from other places, time, and between populations, or between subgroups within a population. As most of us engaged in medical research are not trained epidemiologists, our understanding of these terms requires clarification, so that we understand the same thing when a particular term is used.

Incidence and prevalence are both rates, but they

are neither equivalent nor interchangeable. **Incidence** refers to the new occurrence of disease in a defined population over a specified period of time. Incidence rate for any condition is usually cohort, specific, and optimally used for **studying etiology or causation of disease**. **Prevalence** means the total number of existing disease cases of all, or particular, ages in a defined population of a given point in time, or during a specified delimited period. Prevalence rates are cross-sectional in nature and therefore cover all existing cases of cumulative burden of a condition or its sequelae. It is important to remember limitations of prevalence data as it is

*B.S. Gupta, Department of Community Medicine,
Al-Arab Medical University, Benghazi.*

often tempting to use it for casual inferences because they are readily obtainable than incidence data. Two factors determine the prevalence: those conducted with occurrence of new cases and these connected with the duration.

Most commonly accepted definitions, and their meaning, have been provided by the International Epidemiological Association and W.H.O. which are cited below for ready reference (1,2).

Incidence rate: The rate at which new events occur in population. The numerator is the number of new events that occurs in a defined period; the denominator is the population at risk of experiencing the event during this period. The incidence rate is calculated by the formula:

$$\frac{\text{Number of new events in specified period}}{\text{Number of persons exposed to risk during this period}} \times 10^n$$

For example; in a study of oral contraceptive (OC) use and bacteriuria, a total of 2390 women aged 16 to 49 years were identified who were free from bacteriuria. Of these, 428 were OC users at the initial survey in January 1983. At a **second survey** in December 1983, 27 of the OC users had developed bacteriuria. This results in an incidence of bacteriuria among OC users of 27 per 482 or 5.6 percent during a year.

Prevalence Rate: The total number of all individuals who have an attribute of disease at a particular time (or during a particular period) divided by the population at risk of having the attribute or disease at this point in time or midway through the period. The prevalence rate is calculated by the formula:

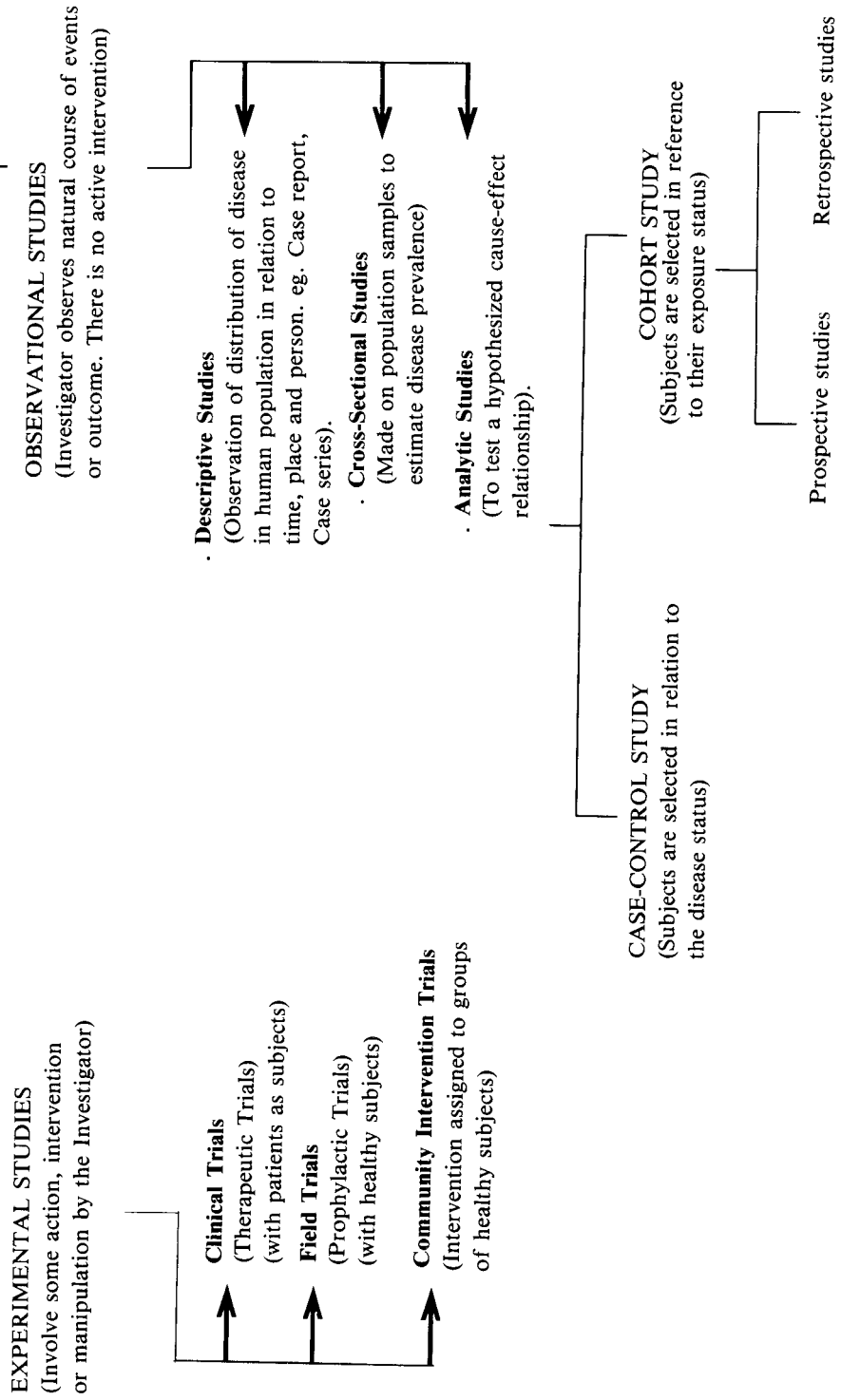
$$\frac{\text{Number of cases (old and new) of a specified disease existing at a given point of time}}{\text{Population examined at the same point in time}} \times 10^n$$

For example, in a visual examination survey conducted among individuals 50 to 85 years of age, 310 of the 2477 persons examined had cataracts at the time of survey. The prevalence of cataract in that age group was therefore 310 per 2477 or 12.5 percent. Thus, prevalence can be thought of as the status of the disease in a population at a point in time and as such is also referred to as point prevalence.

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EPIDEMIOLOGIC STUDY METHODS



A Study of Ectopic Pregnancy at Al-Jamahiriya Hospital , Benghazi

S. Taher, Shail Khanna and M. M. Legnain

(Received March 10, 1994)

الملخص

من الحالات التي عولجت بمستشفى الجماهيرية في بنغازي ، درست 100 حالة حمل خارج الرحم لمعرفة نسبة حدوثها وأسبابها المحتملة ونتائجها بالنسبة للمرأة الحامل . ولقد لوحظ أن نسبة الحدوث قد ارتفعت من 0,1% في سنة 1983 م إلى 0,21% في سنة 1986 م . كما لوحظ أن من الأسباب المؤدية إلى الحمل خارج الرحم الإصابة بمرض التهابات الحوض والجراحات على الحوض . ورغم أن 92% من الحوامل حدث لها تمزق بوقي إلا أنه لم ينتج عن هذا الحمل أي وفيات .

Summary

A total of 100 cases of ectopic pregnancy treated at Al-Jamahiriya Hospital, Benghazi, was studied to evaluate the prevalence, possible aetiological factors, and maternal outcome. The prevalence increased from 0.1% in 1983 to 0.21% in 1986. Important aetiological factors were pelvic inflammatory disease and previous pelvic surgery. Although 92% patients presented with a ruptured tubal pregnancy, but there was no maternal death.

INTRODUCTION:

Ectopic pregnancy is a major health problem and is an acute threat to a patient's life and potential fertility. It is responsible for 10% of maternal mortality in U.S.A. and 30 to 70% of patients prove infertile after an ectopic pregnancy (10).

During the past decade a change in prevalence of the condition has been reported all over the world due to changing aetiological factors including in-vitro fertilization and GIFT.

This study was carried out at Al-Jamahiriya Hospital, Benghazi, Libya, to determine the prevalence of this condition in Benghazi and evaluate the possible aetiological factors. An assessment of diagnostic facilities and treatment

provided was done in terms of maternal mortality and morbidity.

MATERIAL AND METHODS:

During the four years period from January 1983 to December 1986 one hundred cases of ectopic pregnancy admitted to Al-Jamahiriya Hospital were analyzed.

Detailed history and clinical examination was supplemented with diagnostic procedures such as qualitative pregnancy test, ultrasound scanning, laparoscopy and culdocentesis. Diagnosis was confirmed by histological examination in doubtful cases. The results were analyzed and discussed in the light of previous reports.

*S. Taher, Shail Khanna and M. M. Legnain,
Department of Obstetrics and Gynaecology,
Faculty of Medicine, Al-Arab Medical University, Benghazi, Libya.*

TABLE I: Incidence of ectopic pregnancy

Year	Total No. of Ectopic Pregnancies	Total Number of Deliveries	Percentage
1983	18	16475	0.11%
1984	24	16737	0.14%
1985	24	15991	0.15%
1986	34	15928	0.21%
TOTAL	100	65131	0.15%

RESULTS:

Table I shows the incidence of ectopic pregnancy to be 0.15% deliveries. The data shows the increasing trend in incidence from 1983, 0.11% to 0.21% deliveries in 1986.

The largest number of cases were from age group 20 to 34 (88%) with highest in age group of 25 - 29 years. Only 10% cases were in the age group above 30 years and 2% below the age of 20 years.

No significant relation was obtained with regards to effect of parity on incidence of disease. But average parity was found to be 2.9.

41% incidence was found in para two to four, and 18% incidence in multipara.

Typical trail of symptoms of amenorrhoea pain and bleeding was the most common presentation found in 75% cases. A history of previous menstrual abnormality was found in 10% of patients. Amenorrhoea of less than one month in 12 cases, of two months in 61 cases, and in 3 cases of more than 2 months. 24 cases had no history of amenorrhoea.

Abdominal tenderness and cervical excitation were the most consistent findings, found in 77% and 61% respectively. Definite mass could be palpated in 17% of the cases. 13% of cases came

in shock. Haemoglobin was less than 10 gms. in 30% of cases.

Past history of the patients (Table II) revealed that 30% of them had suffered from pelvic inflammatory disease, including two cases of treated tuberculous endometritis. Out of 16 cases with a history of infertility, 11 suffered from secondary infertility. A past history of previous pelvic surgery, included caesarean section, appendectomy, myomectomy and ovarain cystectomy and tubal ligation. 18 patients gave history of previous abortions followed by a curettage. 20 patients were using contraception, of whom 5 were using IUCD

TABLE II: Past history of associated factors related to ectopic pregnancy

Associated factors	No. of cases
History of pelvic inflammatory	36
History of Infertility	16
History of previous pelvic surgery	15
History of abortion followed by D & C	18
History of contraception	20
History of ectopic pregnancy	3

and two had the device in situ at admission, in the remained the device had been removed 2 to 14 month previously. Three patients previously had undergone surgery for ectopic pregnancy.

Culdocentesis was positive in 14 out of 15 cases; all presented after tubal rupture. Ultrasound, the most useful investigation was positive in 64 cases (Table III and IV). 89% of these showed adnexal mass and 53% showed presence of free fluid in peritoneal cavity. Laparoscopy was diagnostic in 21 cases. 46 cases were operated within six hours, 33 within 24 hours, and 21 cases who had to undergo laparoscopy were operated soon after laparoscopy under same anaesthesia.

TABLE III. Results of diagnostic procedures

Results of Diagnostic Procedure	No. of cases	Percentage
Immunological pregnancy Test	64	
Positive	40	62%
Ultrasonography	100	
Positive findings	64	64%
E.U.A.	18	
Adnexal mass	12	66%
Fullness in pouch	5	27.7%
No abnormality	1	5.6%
Culdocentesis	15	
Positive	14	93.3%
Laparoscopy	21	21%

TABLE IV: Ultrasound findings in ectopic pregnancy.

U.S. FINDINGS (64 Patients)	No. of cases	Percentage
Free fluid, blood or blood clots in peritoneal cavity	34	53%
Adnexal mass	41	89%
Intrauterine gestational sac	4	6.25%
Extrauterine gestational sac with active foetal heart	3	4.69%
Suspected Intra and Extra-uterine pregnancy	4	6.25%

Irregular echoes in the uterus	18	28%
Pelvi-abdominal mass	1	1.5%
Term-interuterine pregnancy with thickening of uterine wall	1	1.5%

Table V shows the laparotomy finding. There were 98 cases of tubal pregnancy (57 in right tube and 41 in left tube), one case of ovarian pregnancy and one case of secondary abdominal pregnancy. Evidence of pelvic inflammatory disease in the form of pelvic adhesions, hydrosalpinx, peritubal adhesions, inflamed or blocked tube was seen in 34 cases. In cases of ovarian pregnancy and secondary abdominal pregnancy, the ipsilateral tube was normal. In 27 cases, the ovaries on the side of ectopic showed cystic or polycystic changes. The site of tubal pregnancy was ampullary in 63 cases, fimbrio-infundibular in 16, isthmal in 13 and cornual in 6 of the cases.

Salpingectomy alone or salpingo-oophorectomy was done in 92 cases. Since most of these cases presented with ruptured tubal pregnancy. Conservative surgery in the form of "milking" was performed only in three cases, in one case of tubal abortion no surgery was necessary except for ensuring haemostasis (Table VI).

In 84 cases, specimens removed were sent for confirmation by histological examination. The diagnosis was confirmed in 80% cases and additional findings reported on these were acute or chronic nonspecific salpingitis in 4 cases, schistosomiac salpingitis and endometriosis in ovary in one case, haemorrhagic ipsilateral corpus luteum in 4 cases. 4 cases in which the diagnosis was not ectopic pregnancy, two were reported to have chronic non-specific salpingitis and one had ruptured corpus luteum haematoma with congested tube and one had oedema and congested tube only. In these cases operative diagnosis was tubal abortion and one was of doubtful ovarian pregnancy.

The most common post-operative complication was anaemia (47 cases). Morbidity in term of hospital stay of more than 7 days in 68 cases. No maternal death was recorded.

TABLE V. Showing laparotomy finding in 100 cases operated for ectopic pregnancy.

OPERATIVE FINDINGS	NO. OF FINDINGS	PERCENTAGE
Haemoperitoneum	90	90%
Evidence of pelvic inflammatory disease	34	34%
Uterus		
Perforated in	2	2%
Normal size	36	36%
Enlarged	62	62%
Fallopian tube		
Ipsilateral tube - Tubal pregnancy	98	98%
Normal Tube	2	2%
Contralateral tube - Absent	5	5%
With signs of salpingitis	14	14%
Normal	81	81%
Ovaries		
Ipsilateral with pathological lesion	26	26%
Absent	2	2%
Doubtful ovarian pregnancy	1	1%
Contralateral ovary		
Normal	90	90%
With pathological lesions	10	10%

TABLE VI. Showing Surgical Treatment in 100 cases of Ectopic Pregnancy

Operation	No. of cases	Percentage
Salpingectomy	72	72%
Salpingo-oophorectomy	20	20%
Milking	3	3%
Excision of Cornua and repair	2	2%
Laparotomy - delivery of term baby leaving the placenta in situ followed later by Methotrexate therapy	1	1%
Ovarian reconstruction after removal or conceptional product	1	1%
No surgery except ensuring haemostasis in case of tubal abortion	1	1%
Total	100	100%

DISCUSSION:

This study shows an increasing incidence of ectopic pregnancy, from 0.1 in 1983 to 0.21% in 1986 as has been reported from many parts of the world (2, 3). The explanation for this is the increasing incidence of salpingitis (8) sexually transmitted disease (7), use of microtubal surgery (13), progesterone contraceptive (14), IUCD (5) and IVF and GIFT techniques (16). The highest incidence of 3.6% was reported by Arif and Hafez (1973) from West Indies (1).

The most important associated factor was pelvic inflammatory disease, 36 cases as proven by history and laparotomy findings. Evidence of pelvic inflammatory disease was reported as 30 - 50% in series of Hallet (1968) at laparotomy (5). Helbrecht

(1956) found that two-thirds of pregnancies occurring after treatment of tubercular salpingitis were ectopic (6). A history of previous pelvic surgery was present in 15 cases, and 3 were recurrent cases of ectopic pregnancy. Langer, (1982) studied existing pelvic disease and condition of contralateral tube at the time of conservative tubal surgery for ectopic pregnancy (11). He observed 7% incidence of ectopic with a contralateral normal tube, 18% in whom surgical repair was carried out and 25% in those where contralateral tube was removed.

Oelsner (1987), described the incidence of recurrent ectopic as 11.5 to 14.2% (12). In present series 3% had recurrence of ectopic pregnancy.

Progress in diagnostic techniques such as ultrasound and radio-immuno-assay of BHCG enables an early diagnosis of ectopic gestation. Ultrasound is a very important diagnostic tool but its finding should be considered along with the clinical findings and results of qualitative and quantitative pregnancy tests. As ultrasound findings taken alone can be misleading in a significant number of cases. Vaginal sonography has further improved the possibility of early diagnosis. Laparoscopy has an important role in early diagnosis, before rupture of the tube enabling conservative treatment can be provided. In fact, if all facilities including BHCG radio-immuno-assay, ultrasound scanning and laparoscopy are available, catastrophic presentation of ruptured ectopic and haemoperitoneum should no longer be common.

Due to the late presentation, 92 cases were treated by salpingectomy. Though an early diagnosis before rupture provides an opportunity for conservative surgery such as linear-salpingostomy or and to end anastomosis after resecting the involved segment. Possible chemotherapy with methotrexate (15) and therapy by local injection of prostaglandin (9) in haemodynamically stable patient with serial BHCG radio-immuno-assay follow up has opened a ray of hope in the treatment of ectopic pregnancy in patients with only one functioning tube.

CONCLUSION: .

The incidence of ectopic pregnancy is increasing in Benghazi as has reported from other parts of the

world. The main aetiological factors were a history of pelvic infection, with or without IUCD and previous pelvic surgery. Improvement reproductive outlook in future can be achieved with presentation of a functional tube, by tubal surgery and an early diagnosis by radio-immuno-assay of BHCG and abdominal and vaginal sonography.

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Drug Consumption Pattern among Libyan Women during Pregnancy

M. M. Baccush, S. Oommen and O. Abusnina

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الملخص

من بين (1169) امرأة وضعت طفلها في مستشفيات الولادة بمصراتة وغريان ، وجد أن 70,8% منهن قد استعملن مقويات الدم وأدوية أخرى خلال فترة الحمل ولوحظ أن كل امرأة استعملت ما بين (1) إلى (6) عقارات وكانت أكثر الحوامل استعمالاً للعقارات هن اللاتي بين 25 إلى 29 سنة من العمر (89%) المتعددات الحمل (83%) من هذه النساء تناولن العقاقير من ذاتهن وبدون استشارة الطبيب .

معظم الحوامل (81,1%) تناولن فقط فيتامينات وحامض الفوليك والحديد ، (22,4%) منهن تناولن مضادات الحموضة و 14,5% المسكنات . بينما تناولت بعض النساء بالإضافة إلى ذلك عقاقير مضادات القيء ومضادات الحيوية ومضادات التشنج وموسعات القصبات . في الثلث الثالث من الحمل 42,5% من الحوامل كن يتناولن أدوية . هناك حاجة إلى إجراء دراسات أخرى مستقبلية حول تأثير هذه الأدوية على صحة الأم والطفل في ليبيا .

SUMMARY

Out of 1169 delivered women, 932 (79.8%) used haematenics and other drugs during pregnancy. A range of 1 - 6 drug preparations per woman was noted. The majority of mothers attending antenatal care, 777 (86.5%), consumed drugs. By age and parity, more usage was observed by the age group 25 - 29 years; 340 women (84%), and by multigravidas, 717 women (83%). Among 165 women (17.7%), the drugs were self-medicated. A large number of women, 756 (81.1%), had only consumed multivitamins, folic acid and iron, followed by antacids 209 (22.4%), and analgesics 135 (14.5%). Various other drugs such as antiemetics, antibiotics, antispasmodics and bronchodilators were also used by some women. During the third trimester, 396 women (42.48%) were on drugs.

Further prospective studies are needed to study the effect of drugs on maternal and child health in Libya.

INTRODUCTION:

Medications can have harmful and beneficial effects on the foetus and mother at any time during pregnancy. Experience with many drugs in

pregnancy upto 1985, is limited (22). However certain drugs are recognised as being associated with a higher incidence of both fetal well-being and fetal injury or abnormality, and they must be used with

MM Baccush, S Oommen and O Abusnina,
Department of Family & Community Medicine,
Faculty of Medicine, Great Al-Fateh University of Medical Sciences, Tripoli, G.S.P.L.A.J.

greatest care. After the thalidomide disaster of 1961, which affected several hundred infants with phocomelia, it has become a matter of concern to look for the pattern of drug consumption in pregnant women (18). The pattern, which may vary from country to country, also seems to be changing (20). With this aim, this retrospective study was undertaken to assess the extent of drug consumption pattern among Libyan pregnant women.

MATERIAL AND METHODS:

The study was carried out to determine the drug consumption pattern among 1169 women who had their delivery in the maternity wards of Musrata and Gariyan Hospital and also the Al Gella Hospital of Tripoli (Libya) during the year 1991 (May-December). Data was collected through a structured questionnaire specifically designed to find out the pattern of drug consumption by pregnant women. All women were contacted in the maternity ward within 10 - 12 hours of delivery. An attempt to correlate drugs consumed during pregnancy with the outcome of the pregnancy was unsuccessful as the survey was based on recall basis. Further, some mothers were reluctant to admit taking medications, and even the exact time of commencement and duration of drug consumption was, for the most part, difficult to ascertain. However, a great effort has been made to obtain a complete data on specific drugs being consumed during the pregnancy period.

RESULTS:

Of the 1169 women interviewed, 932 (79.8%) admitted to have had medicaments during pregnancy.

Table I shows that of the 1169 delivered women, 779 (86.5%) consumed drugs and 898 women (76.8%) received antenatal care. Out of 271 (23.2%) women who had received antenatal care, 155 women (57.2%) had medication during pregnancy.

When the drug consumption pattern was analyzed by maternal age (Table 2) it was found that 340 (84%) young women in peak reproductive period, between 25 - 29 years of age, consumed drugs, more than any other group.

Table 1 also shows that 717 (83%) multigravidas 215 (70.3%) utilized medicines more often than the primigravidas, and this relation was found to be statistically significant ($P < 0.001$).

Trimesterwise, it was found (Table 1) that among those who were taking drugs, 228 (24.4%) took them in first trimester, 207 (22.2%) in second trimester, and 396 (42.4%) in their last trimester. One hundred women (11%) were not sure in which trimester they utilized drugs.

Most women 767 (82.3%) were taking prescribed medicine but 165 (17.7%) had self medication. Table (3) shows the medications used during pregnancy. Most of the women 756 (81.1%) consumed desirable products like multivitamins, Folic acid/iron containing preparations. The other most common groups of drugs taken were: antacids; 209 (22.4%), antibiotics (mostly ampicillin); 192 (20.6%), and analgesics, like paracetamol or aspirin; 135 (14.5%), and antiemetics; 69 (7.4%). Other drugs like oral hypoglycaemics by 6 (0.6%), insulin by 21 (2.3%), hormonal preparations by 20 (2.1%), bronchodilators by 25 (2.7%), antitussive by 20 (2.1%), diuretics by 10 (1.07%), anti-histaminics; 21 (2.25%), tranquillizers: 15 (1.6%), antifungal: 20 (2.1%), and calcium containing preparations: 10 (1%).

The main medical problems encountered during pregnancy included anaemia 150 (12.83%), hyperemesis gravidarum 83 (7.1%), vaginal bleeding 45 (3.84%), U. R. I. 48 (4.10%), hypertension 82 (7.01%), U. T. I. 28 (2.39%), diabetes mellitus 32 (2.73%), bronchial asthma 35 (2.99%) and jaundice 6 (0.51%).

Figure (1) shows the distribution of number of drugs consumed by pregnant Libyan women. Most women (310) were consuming three types of drug preparations. An average of 1 - 6 drug preparation/patient was noted.

Table (1) indicates drug consumption in relation to type of delivery. It was found that 226 (71%) women who consumed drugs gave history of abnormal deliveries and the association between drug consumption pattern and type of delivery was found statistically significant ($P < 0.001$).

N. B.: Normal babies were born to 755 women, of

these 599 (79.4%) utilized drugs during pregnancy while 156 (20.6%) did not. Abortion occurred in 90 women, of these 63 (70%) took medicines and 27 (30%) did not take medicine during pregnancy.

Of the total 932 who used drugs, 324 (33.72%) gave birth to neonates with health problems viz. respiratory distress syndrome in 19 (86.4%) 186 (83%) with large babies, 34 (79%) with low birth weight babies, still births in 24 (88.9%). Other associated problems were seen in another 7 babies (see Table 4).

DISCUSSION:

Drug utilization poses particular problems in rapidly developing countries such as the Libyan Arab Jamahiriya where there appears to be considerable use and abuse of drugs (2, 10). Drugs consumed during pregnancy may be beneficial of harmless, but others are teratogenic. This study suggests that the extent of drug usage during pregnancy is similar to that observed in earlier surveys in other countries (9, 13, 15).

In the present study, influence of age and parity showed that more usage in the age group 25 - 29 years and in multigravidas. Similarly among Saudi pregnant women, the drug consumption was higher in 20 and 40 years of age, but more in primigravidas (3). Utilization of drugs among antenatal attenders was more because most of them received iron and multivitamin tablets. Several papers have associated folic acid deficiency with abortion, premature delivery and low birth weight babies (12, 21). Two reports have alluded to problems with high folic acid levels in the mother during pregnancy (4, 17), and other untoward complications for other vitamin supplements (11, 14).

A study of primary health clinics of Libya showed that prescriptions for Obstetric & Gynaecology patients mainly included vitamins, haematinics and analgesics, with hormones being prescribed relatively frequently (1). In the present study also, analgesics were used by 23 (18.54%) of mothers. Their regular consumption during pregnancy have been associated with foetal malformations, prolongation of gestation period, increased incidence of anaemia, complicated delivery and a

higher perinatal mortality (6). Antibiotics were also used by 15 women (12.09%) to protect against infection which was similar to the Scottish study (20). Of our patients 10.48% used antiemetics, however some antiemetics are suspected to be teratogenic (16). Exposure to uterine relaxants (tocolytics) is likely to occur only in women attending antenatal clinics in hospitals. These agents were used by 50 of our patients (5.4%), but they have been reported to induce arrhythmia in the foetus (19), and are relatively contraindicated in mothers with diabetes mellitus and cardiac disease (8). Antacids ranked second in the study and these drugs with high sodium content should be avoided or not prescribed so frequently (5). However, our analysis of drugs consumed cannot be ascertained in the absence of the actual prescriptions scrutinized.

Although the majority of mothers who delivered infants with medical problems had consumed drugs during their pregnancy, it is difficult to relate these neonatal health problems to drug consumption, as they may have been already at risk of these complications as a result of disease. Although the evidence in some cases is not strong, but some drugs are thought to cause perinatal abnormalities and malformations, especially if they are taken in the first trimester, from the 3 - 11th week of pregnancy. During second and third trimester drugs may affect the growth and functional development of foetus or have toxic effects on foetal tissues. Drugs given shortly before term or during labour may also have adverse effects on the neonate. Many patients may have to be assessed before any drug can be declared non-teratogenic. Such assessments are often prolonged and difficult to make, especially when drug is used commonly in pregnancy, because there may be other causative factors such as genetic predisposition, age, alcohol intake, cigarette smoking, and simultaneous ingestion of non-prescription items (7).

The present data we hope, will draw attention to the pattern of drug use in pregnancy in Libyan women, and it shows that they use it extensively, particularly prescribed medicines.

Studies are needed to clarify the specific impact and facilitate the development of preventive and/or

curative strategies. This knowledge when authentic and beyond controversy, must be transferred to all interested parties: physicians, nurses, mothers-to-be, and the general public - as an individual will be more inclined to seek and follow medical advice. The impact of such developments

on the use of drugs by the medical profession and public in general will then need to be evaluated (23).

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TABLE 1: Distribution of women during pregnancy according to antenatal case, gravida, type of delivery and trimester, and drug consumption pattern

	Total number	Consumed drugs No (%)	Not consumed drugs No (%)	P Value
Antenatal case:				
Received	898	777 (86.5)	212 (13.5)	< 0.001
Not received	271	155 (57.2)	116 (42.8)	
Gravida:				
Primi	306	215 (70.3)	91 (29.7)	< 0.001
Multi	863	717 (83.0)	146 (17.0)	
Type of delivery:				
Normal	851	706 (83.0)	145 (17.0)	< 0.001
Abnormal	318	226 (71.0)	92 (29.0)	
Trimester:				
1st		228 (24.4)		
2nd		207 (22.2)		
3rd		396 (42.4)		
Uncertain when		101 (11.0)		

TABLE 2: Mothers according to their age and pattern of drug consumption

Age in years	Drug consumption among pregnant women				Total cases (n = 1169)
	Consumed		Not consumed		
	No.	%	No.	%	
15 - 19	16	69.6	7	30.4	23
20 - 24	190	76.9	57	23.1	247
25 - 29	340	84.0	65	16.0	405
30 - 34	204	79.7	52	20.3	256
35 - 39	136	74.7	46	25.3	182
40 - 44	46	82.1	10	17.9	56

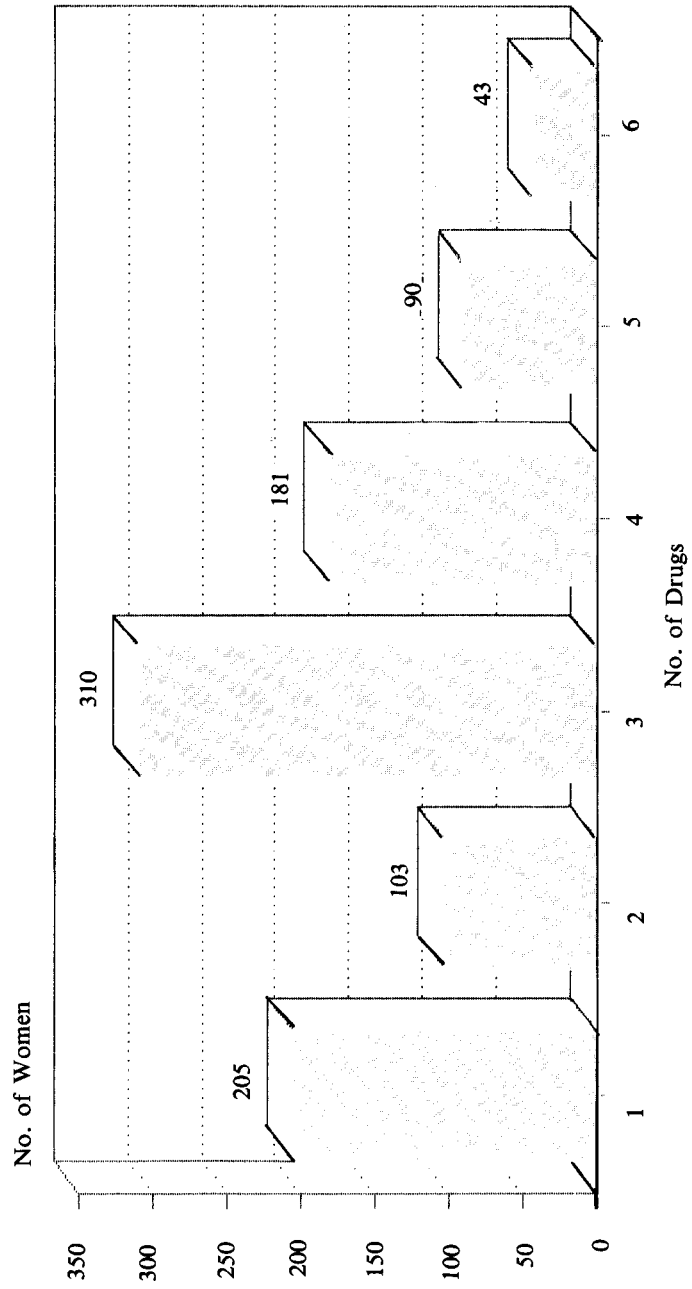
TABLE 3: Medications used during pregnancy

Type of drug	Cases consumed drugs	
	No. (%)	
Multivitamins, folic acid/iron preparations	756	(81.1)
Antacids	209	(22.4)
Antibiotics	192	(20.6)
Analgesics	135	(14.5)
Antiemetics	69	(7.4)
Antihypertensive	67	(7.2)
Tocolytics	50	(5.4)
Others	168	(18.0)

TABLE 4: Associated health problems among new born according to drug utilization by their mothers during pregnancy.

Health problems in newborns	Drug consumption among pregnant women		Total cases (n = 324)
	Consumed	Not consumed	
	No. (%) (n = 270)	No. (%) (n = 54)	
Respiratory distress syndrome	19 (86.4)	3 (13.6)	22
Large babies	186 (83.0)	38 (17.0)	224
Low birth weight babies	34 (79.0)	9 (21.0)	43
Still births	24 (88.9)	3 (11.1)	27
Others	7 (87.5)	1 (12.5)	8

**Fig. 1 DISTRIBUTION OF NUMBER OF DRUGS
CONSUMED BY LIBYAN PREGNANT WOMEN**



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The Influence of Cysteine Pre-Treatment on the Glutathione and Ascorbic Acid Concentrations in Liver, Kidney and Brain of Mice Treated with Ethanol

B. H. Ali, A. A. Abdelgayoum, A. A. Bashir and M. El-Fakhri

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الملخص

تناولت هذه الدراسة تأثير إضافة الكحول الإيثيلي لماء شرب الفئران الصغيرة (بتركيز 5 و 10 و 20%) لمدة (4) أسابيع ، على تركيزات الغلوتاثيون وحامض الأسكوربيك في أكباد وكلى وأدمغة هذه الفئران ، وكذلك تأثير حقن الحامض الأميني سيستين (100 ملجم/كجم في العضل) على هذه المتغيرات .

أحدث الكحول نقصاً في تركيز هذه المتغيرات ، وكان النقص في حامض الأسكوربيك أكثر نسبياً من النقص في مادة الغلوتاثيون في الدماغ . لم يتأثر النقص في هذه المتغيرات بإعطاء السيستين . في تجربة أخرى أعطي الكحول عن طريق الفم بجرعات متزايدة (2.5 و 5 و 7.5 و 10 ملجم/كجم) ثم قتلت الفئران المعالجة بعد (24) ساعة ، وتم قياس الغلوتاثيون وحامض الأسكوربيك في الأنسجة سالفة الذكر . أحدث الكحول نقصاً (حسب الجرعة) في الغلوتاثيون ونقصاً (لا يعتمد على الجرعة) في حامض الأسكوربيك .

أعطي الكحول (5 ملجم/كجم) أو سائل كلوريد الصوديوم (0.9%) عن طريق الفم لفئران تم قتلها بعد فترات متفاوتة (2 و 4 و 8 و 12 و 24 ساعة) من إعطاء الكحول . حدث نقص معنوي في تركيز الغلوتاثيون وحامض الأسكوربيك بعد ساعتين من إعطاء الكحول واستمر هذا النقص في هاتين المادتين وبلغ ذروته في 8 إلى 12 ساعة بعد إعطاء الكحول . لم يؤثر إعطاء مادة السيستين على مفعول الكحول في تخفيض تركيزات الغلوتاثيون وحامض الأسكوربيك في هذه التجربة أيضاً .

SUMMARY

Reduced glutathione (GSH) and ascorbic acid (AA) concentrations in liver, kidney and brain were measured in mice given ethanol in the drinking water at concentrations of 5, 10 and 20% v/v, for four weeks. In some of these animals, cysteine (100 mg/kg)

B. H. Ali and A. A. Bashir, Department of Pharmacology,
A. A. Abdelgayoum, M. El-Fakhri, Department of Biochemistry,
Faculty of Medicine, Al-Arab Medical University, Benghazi, Libya.

was injected intramuscularly (i.m.). once every three days during the experimental period. Ethanol produced significant and non-dose-dependent decreases in the concentrations of both compounds in the tissues examined.

In another experiment, ethanol (5 g/kg) or physiological saline were administered orally to mice, which were then killed 2, 4, 8, 12 and 24 h later. There were progressive and significant reductions in the concentrations of GSH or AA in the tissues studied which were maximal at 8 to 12 h. At 24 h the GSH and AA concentrations were not significantly different from those of the control in all the tissues studied, except in the brain in which GSH concentration was still significantly lower than that in the control.

Mice were injected with cysteine (500 mg/kg) or 0.09% v/v NaCl, 24 h before they were given ethanol (5 g/kg) and were killed 24 h later. Ethanol produced significant reductions in GSH and AA. However, cysteine pre-treatment had no significant effect on the ethanol-induced changes.

INTRODUCTION:

Glutathione (GSH) is a major intracellular non-protein sulphahydril compound which plays an important role in the detoxification of electrophilic metabolites of xenobiotics, and reactive oxygen intermediates (19). Ascorbic acid (AA) in mammalian cells functions as a co-factor in certain redox and hydroxylation reactions (14).

Chronic ethanol consumption is known to cause liver degeneration (for a review see 15), and to increase the toxicity of various compounds in the liver (25). The latter effect was suggested to be related to changes induced in GSH metabolism. However, there is no unanimity regarding influence of chronic ethanol consumption on tissue GSH concentrations. In the rat, some workers have reported an increase (2, 11), a decrease (8, 13) or no change (24) in hepatic GSH levels. In man, chronic alcoholic liver disease (CALD) does not affect total glutathione level in liver (17). In contrast, however, acute ethanol administration is established to cause a marked reduction in GSH of rat liver (7, 21).

There is a positive correlation between GSH and AA concentrations in various tissues studied under different physiological conditions (see e.g. 32). However, there are apparently no reports in the literature correlating the influence of ethanol consumption on tissue GSH level with that on tissue AA level, and as far as we are aware, all the published work on the effect of ethanol on GSH, except for the report of (16), was performed in the

rat. It has been reported that ethanol treatment does not always produce the same biochemical effect in rats and mice (5). Despite the fact that the toxicity of ethanol does not occur only in the liver but extends to other tissues (10), little work seems to have been reported on the effect of ethanol in extrahepatic tissues (7). Therefore, the present work was carried out on mice to find out the effects of acute and chronic ethanol consumption on the concentrations of GSH and AA in the liver, brain and kidney. Furthermore, we have looked at the effects of pretreatment of mice with the GSH precursor, cysteine, in both chronically and acutely-treated animals. The time course of changes occurring in the concentration of these compounds has also been investigated.

MATERIALS AND METHODS:

Locally-bred Swiss albino male mice weighing 27 - 33 g were caged in groups at controlled temperature ($22 \pm 2^\circ\text{C}$) and relative humidity of 50 - 60%. They were fed on nutritionally adequate pellets (National Company for Animal Feeds, Benghazi) and water *ad libitum*. In some experiments various concentrations of ethanol were added to the drinking water.

Four experiments were conducted. In the first (designated chronic experiment) mice were randomly divided into eight groups (n = 8 per group). Group I control, receiving no ethanol; Groups 2, 3 and 4 were given ethanol 5% V/V in their drinking water for three days, then group 2

was maintained on this regimen for 4 weeks, while groups 3 and 4 were given drinking water containing 10% v/v ethanol for another three days. Thereafter mice in group 3 were continued on this regimen for further 4 weeks, while the concentration of ethanol given to mice in group 4 was increased to 20% v/v and maintained for 4 weeks. The aim of the gradual increase in the concentration of ethanol was to accustom the mice to the taste of ethanol, as was done previously in turkey poults (1). Groups 5, 6, 7 and 8 were treated in a similar fashion to groups 1, 2, 3, and 4 respectively, except that the animals in the former groups were injected intramuscularly (i.m.) with cysteine (pH 7.4) at a dose of 100 mg/kg once every 3 days during the experimental period. Control animals received saline injections instead of cysteine. The mice were weighed at the start of the experiment, and at weekly intervals thereafter. Water intake for the eight groups were measured daily by subtracting the volume of the residual water from the stock provided fresh every morning. At the end of the experiment, the mice were killed by cervical dislocation and decapitation. The liver, left kidney and whole brain were quickly removed and placed in ice-cold saline (0.9 w/v NaCl), then frozen at -70°C in a deep freezer to await biochemical analysis within one week.

In the second experiment (designated acute experiment) mice were divided into five groups (n = 5 - 8 per group). Group 1 was given saline (2 ml/kg) by a gastric tube. Mice in groups 2, 3, 4 and 5 were given 2.5, 5, 7.5 and 10 g/kg ethanol orally as a 40% v/v solution in saline. In group 3, three out of six, and in group 4, two out of eight mice died before the end of the experimental period (24 h). The rest of the animals survived and were killed 24 h after ethanol administration. The liver, left kidney and whole brain were removed and processed as above.

In the third experiment, three groups of mice were used (n = 5 per group). One group was kept as control. Another group was given ethanol (5 g/kg, orally) and the third group was given the same dose of ethanol but was pretreated 24 h earlier with cysteine (pH 7.4) at a dose of 500 mg/kg i.m. All the animals were killed 24 h after ethanol

administration and the same organs removed and processed as before.

In the fourth experiment, the time course of ethanol-induced effects on GSH and AA was studied. Mice were divided into 6 treated and 6 corresponding control (n = 5 per group). The controls were given saline and the treated mice were given ethanol (4% v/v) at a single oral dose of 5 g/kg. The animals were killed 2, 4, 8, 12 and 24 h after the treatments. Liver, kidney and whole brain were quickly removed and stored as before.

Biochemical analysis: GSH concentration was determined as total acid soluble sulphahydryl groups by the spectrophotometric method of Sedlak and Lindsay (23), GSH represents at least 85% of the sulphahydryl groups measured. Total AA was measured by the spectrophotometric method of Roe and Keuther (22).

Drugs and Chemicals: L-cysteine (Carlo Erba, Italy) and absolute ethanol (Riedel-De Haen, West Germany) were used. The rest of the chemicals were of Analytical Reagent grade.

Statistical Analysis: Reported values are means \pm s.e.m. (number of observations). Differences between group means were evaluated by the unpaired Student's t test. P values more than 0.05 have been considered insignificant.

RESULTS:

Effect of chronic ethanol intake on body weight and water consumption:

As shown in Fig. (1), ethanol in the drinking water produced steady decreases in the body weights of mice averaging 12% of initial body weight by the end of 4 weeks. Water consumption was reduced by ethanol in a dose-dependent manner, and the reduction in water intake ranged from 7 to 24% compared to the control (data not shown). Cysteine treatment had no significant effect on these reductions in body weight and water consumption caused by ethanol.

Effect of chronic ethanol intake on tissue GSH and AA concentrations, and influence of cysteine treatment thereon:

The results of this experiment are shown in Table (1). There were significant non-dose dependent

decreases in hepatic GSH and AA concentrations in mice given ethanol in the drinking water at levels of 5, 10 or 20% v/v ($P < 0.05 - 0.01$). The reductions in hepatic AA concentrations were more marked (23 - 53%) compared to those in GSH concentrations (10 - 18%). Ethanol (5 or 20% v/v) did not affect significantly renal GSH or AA concentrations ($P > 0.1$). However, at a concentration of 10% v/v, there were significant decreases in both parameters ($P < 0.05$). At the level of 20% v/v ethanol, only AA was significantly decreased ($P < 0.001$). In the brain, GSH concentration was not significantly altered by any of the doses of ethanol used ($P > 0.1$). However, there was a significant dose-dependent decrease (amounting to 40 - 55%) in the AA concentration in brain after ethanol ingestion ($P < 0.01$).

Cysteine treatment did not significantly affect GSH or AA concentration in any of the tissues studied in control mice ($P > 0.1$). However, in ethanol-treated mice, the observed decreases in GSH and AA concentrations were either unaffected or slightly decreased further by cysteine treatment (Table 1).

Relationship between ethanol dosage and tissue GSH and AA concentrations:

The results of this experiment are shown in Fig. (2). Mice were dosed orally with ethanol at doses of 2.5, 5, 7.5 and 10 g/kg, and were killed after 24 h. In the group receiving 7.5 g/kg two out of five mice died overnight, and in the group receiving 10 g/kg six out of eight animals died within 3 h. The rest of the treated animals survived. In the liver there were dose-dependent significant decreases in GSH concentration. The hepatic AA concentrations were significantly decreased (by 25% to 40%) after ethanol treatment, but not in a dose-dependent manner. In the kidney decreases of about 20% to 40%, in both compounds occurred in mice treated with ethanol at doses of 2.5, 5 and 10 g/kg. Dose-dependent and significant ($P < 0.01$) decreases were found in the concentrations of GSH in brains of ethanol-treated mice. About 50% reductions ($P < 0.01$) were found in the AA concentrations in brains of mice treated with 2.5, 5 or 7.5 g/kg ethanol.

Time course of ethanol-induced changes in tissue-GSH and AA concentrations:

Table (2) shows the decrease in GSH and AA concentrations with time in the liver, kidney and brain of mice following an acute oral dose of ethanol (5 g/kg). In this experiment control mice were killed at the same time as the ethanol-treated animals to avoid the circadian rhythm in tissue GSH levels. Two hours after ethanol administration there were progressive and significant decreases in GSH and AA concentrations, which was maximal at 8 to 12 h. At 24 h the GSH concentrations in liver and kidney of ethanol-treated mice were not significantly different from those of the control ($P > 0.1$). In the brain, however, the GSH concentration was still about 28% less in the ethanol-treated mice than in the controls ($P < 0.05$).

Tissue AA concentrations did not exhibit the circadian rhythm seen with GSH concentration. At 24 h the effect of ethanol on AA tissue concentration was completely reversed.

Effect of cysteine pretreatment on tissue GSH and AA concentrations in ethanol-treated mice:

The results of this experiment are shown in Table (3). Ethanol treatment reduced significantly GSH and AA concentrations, in the liver, kidney and brain ($P < 0.05$). Pretreatment with cysteine (500 mg/kg i/m) had no significant effect on the ethanol-induced reductions in both compounds ($P > 0.1$). GSH and AA Concentrations in tissues of mice receiving ethanol and cysteine were significantly lower than those of the animals given saline only ($P < 0.05$).

DISCUSSION:

We have found that ethanol, given acutely as a single dose, or chronically in the drinking water for various periods, significantly reduced GSH in the liver. Further, it was found that this effect occurs also in kidney and brain, and that AA concentration is also reduced in these organs by ethanol to a more or less similar extent. The decrease in GSH following ethanol has been attributed to tissue toxicity. For example, it has previously been shown that hepatic GSH is depleted a few hours following administration of paracetamol (26) and

bromobenzene (12). The decrease in GSH probably results from increased loss from the tissue or decreased synthesis. This may be caused by the production of free radicals. It has also been suggested that the lowering of GSH content is not the cause of enhanced lipid peroxidation in ethanol toxicity, but may be a result of increased peroxidation in the tissues (16, 30).

An attempt to ameliorate the toxic effect of ethanol, as shown by a decrease in tissue levels of GSH, was made by injecting cysteine to raise the GSH level. Cysteine administration is known to increase cellular levels of GSH (18) as it is the limiting factor for its synthesis. However, because of its potential toxicity, cysteine derivatives may be preferred, although they themselves are known to be subjected to feedback inhibition of γ -glutamyl cysteine synthetase by GSH (18). Increasing GSH levels in tissues is known to protect cells against toxic compounds (19). In the present experiments cysteine did not affect the tissue GSH concentrations of control or treated animals. It is not known whether this is due to the use of insufficient doses of cysteine, or to possible toxic effect of the compound. It is possible that cysteine may have interfered with GSH synthesis by competition with a precursor of GSH such as glutamyl cysteine. In future experiments cysteine derivatives may be more appropriate to use to raise GSH tissue levels.

The maximum depletion of GSH occurred 8 - 12 h after acute ethanol administration, and was reversed, in most instances, 24 h thereafter. It was found that single oral doses of 7.5 and 10 g/kg ethanol were lethal to mice in less than 16 h. It has not been ascertained whether any changes in tissue GSH or AA concentration have occurred. The cause of death was probably the acute central depressant effect of ethanol.

The decrease in GSH level in liver of rats treated acutely with ethanol returned to normal after 16 h in young rats (4 months), whereas they remained depressed in older rats (24 months) (21). Thus it seems that age has a role to play in the susceptibility of rats to acute ethanol toxicity.

In the present work, we have confirmed the

presence of circadian rhythm in tissue GSH which has been reported before in the rat (6). However, in our results the pattern of the rhythm in the liver, kidney and brain in mice was less variable than in the rat. In the AA tissue concentration no such circadian rhythm was found.

In the present work, chronic treatment with ethanol (4 weeks) resulted in significant decreases in GSH in liver and kidney. This finding is at variance with those who found that chronic treatment (5 weeks) with ethanol increases liver GSH concentration in the rat (20). The discrepancy may be ascribed to differences in animal species used or experimental procedures. Our results are in agreement with those which indicated that there is no change in brain GSH levels in rats chronically treated with ethanol (29), but contradict those who reported a decrease in rats after similar treatment (9).

The effect of AA on ethanol metabolism has been studied in many species including man (see 27 and references therein). It has been shown that in G. pig hepatic cells, the enzymes involved in ethanol metabolism are, partly, ascorbate-dependent. However, no specific role for ascorbic acid in ethanol metabolism has been defined *in vivo*. On the other hand the effect of ethanol on AA metabolism has received less attention. Chronic alcoholic patients have lower than normal plasma and tissue AA concentration (4, 28). In contrast, chronic ethanol treatment (10% v/v for 16 weeks) increases ascorbic acid concentration in serum and tissues of rats (31). In the present study, it was found that both the acute and chronic (4 weeks) ethanol treatment caused decreases in AA concentration in liver, kidney and brain of mice. These reductions in AA were comparable to the decreases in GSH. The mechanism by which this decrease is caused has not been examined, but a decrease in synthesis or increased loss of AA from the tissues seems likely. Increased lipid peroxidation that follows ethanol administration (29) may be related to the decrease in AA.

A positive correlation between the tissue concentration of GSH and AA has been shown in

humans under certain physiological conditions. Zalani *et al* (32) have found that GSH concentration in human foetal tissues declines during gestation, to the same extent of the decline in AA level. GSH was found to be decreased in tissues of G. pig fed AA deficient diet (3). In this experiment, this positive association between GSH and AA levels has been found in tissues of ethanol-treated mice. The results support the concept that ascorbate and GSH act as a homeostatic system.

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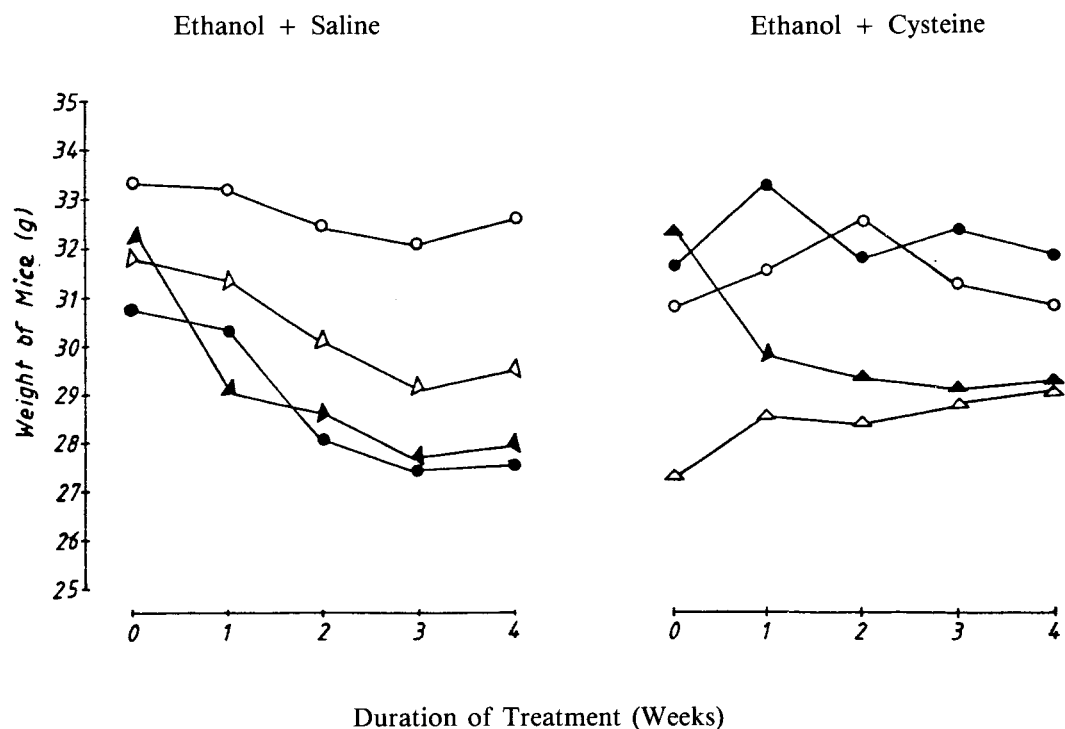


Fig. 1: The effect of ethanol consumption, together with either saline (0.09% w/v NaCl) or cysteine (100 mg/kg) injections, on the body weight of mice. The animals were given ethanol in the drinking water at concentrations of 5% (•), 10% (△) and 20% v/v (▲) for four weeks. Saline or cysteine were injected intramuscularly once every three days during the experimental period. Each point represents mean value from eight animals; s.e.m. in body weight (not shown) was less than 10%, Control animals (o) received ethanol-free water.

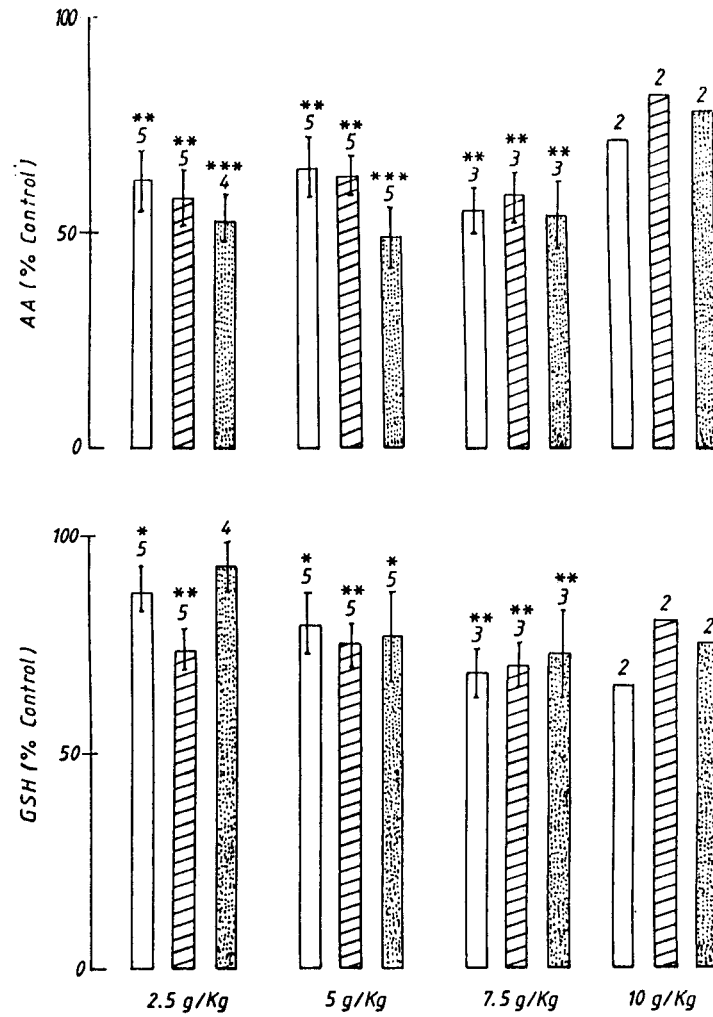


Fig. 2: Glutathione (GSH) and ascorbic acid (AA) concentrations (% control) in the liver (open columns), kidney (hatched column) and brain (stippled columns) of mice given ethanol by the oral route at doses of 2.5, 5, 7.5 and 10 g/kg and killed 24 h thereafter. Each column and vertical bar represents means \pm s.e.m. The numeral on top of each column is the number of animals used. Asterisks denote significant difference from the control. *P < 0.05 **P < 0.01, ***P < 0.001.

Table 1: Glutathione (GSH) and ascorbic acid (AA) concentration in tissues of mice given ethanol together with cysteine* or saline*.**

Tissue	Variable	Control (no ethanol)		Ethanol (5% v/v)		Ethanol (10% v/v)		Ethanol (20% v/v)	
		Saline	Cysteine	Saline	Cysteine	Saline	Cysteine	Saline	Cysteine
Liver	GSH	820.3 ± 28.3	838.2 ± 67.0	716.0 ± 30.5	646.7 ± 40.6	673.6 ± 36.0	679.9 ± 39.1	738.4 ± 33.3	600.9 ± 35.8
	AA	613.4 ± 26.1	586.3 ± 60.0	473.6 ± 22.5	220.9 ± 12.2	284.4 ± 15.9	219.5 ± 09.7	287.0 ± 19.5	185.2 ± 13.1
Kidney	GSH	473.8 ± 29.8	436.2 ± 07.4	520.0 ± 23.1	324.0 ± 12.0	415.7 ± 16.1	408.7 ± 17.1	444.7 ± 21.6	348.9 ± 08.2
	AA	317.0 ± 12.2	269.2 ± 26.9	312.1 ± 12.5	205.0 ± 06.7	277.7 ± 08.0	250.6 ± 11.8	260.7 ± 07.1	237.0 ± 10.1
Brain	GSH	386.5 ± 25.2	381.0 ± 11.2	409.2 ± 18.5	382.9 ± 10.6	375.1 ± 16.2	391.1 ± 16.0	404.4 ± 23.3	352.5 ± 11.6
	AA	399.4 ± 18.3	383.0 ± 17.9	230.5 ± 10.0	110.0 ± 06.8	176.6 ± 13.8	126.9 ± 19.3	174.0 ± 23.7	127.3 ± 07.1

Values in the table (Ug/g/tissue) are means ± s.e.m (n = 5).

For statistical analysis see text.

** Ethanol was given in the drinking water daily at concentration of 5, 10 and 20% v/v for 4 weeks.

* Cysteine (100 mg/kg) or saline (0.09% w/v NaCl) were injected intramuscularly, once every 3 days for 4 weeks, in control and ethanol treated animals.

Table 2: The effect of time on glutathione (GSH) and ascorbic acid (AA) concentrations in tissues of mice treated with ethanol*.

		TIME (h) AFTER ETHANOL ADMINISTRATION					
		0	2	4	8	12	24
GSH							
Liver	Control	884.2 ± 120.2	678.2 ± 44.4	584.9 ± 66.2	451.8 ± 76.0	934.3 ± 78.9	873.4 ± 80.1
	Ethanol	810.2 ± 93.5	498.0 ± 82.2	324.2 ± 49.2	312.6 ± 60.6	631.2 ± 88.9	811.5 ± 90.2
	P	0.1	0.05	0.05	0.1	0.05	0.1
Kidney	Control	501.3 ± 41.2	482.2 ± 39.9	463.7 ± 41.1	533.7 ± 50.1	639.7 ± 41.1	512.1 ± 48.7
	Ethanol	489.7 ± 50.7	380.7 ± 41.2	300.7 ± 25.7	313.5 ± 29.4	426.4 ± 47.2	489.7 ± 53.3
	P	0.1	0.05	0.05	0.05	0.05	0.1
Brain	Control	407.1 ± 33.3	423.3 ± 31.7	387.2 ± 31.1	342.1 ± 40.2	409.3 ± 32.1	419.3 ± 39.9
	Ethanol	389.3 ± 37.7	306.4 ± 40.2	278.7 ± 40.1	222.3 ± 30.1	269.9 ± 30.2	302.1 ± 32.1
	P	0.1	0.05	0.05	0.05	0.05	0.05
AA							
Liver	Control	631.0 ± 40.7	587.3 ± 60.2	602.1 ± 54.8	658.7 ± 40.1	603.3 ± 62.1	599.2 ± 42.7
	Ethanol	643.8 ± 48.9	510.8 ± 42.1	407.7 ± 49.9	418.1 ± 52.1	398.2 ± 40.2	602.9 ± 59.9
	P	0.1	0.1	0.05	0.05	0.05	0.1
Kidney	Control	402.3 ± 30.7	411.7 ± 42.7	422.2 ± 30.7	417.5 ± 33.7	399.7 ± 40.2	397.4 ± 29.9
	Ethanol	398.8 ± 27.3	301.7 ± 21.5	311.1 ± 40.2	300.7 ± 40.2	279.3 ± 28.3	402.2 ± 40.3
	P	0.1	0.05	0.05	0.05	0.05	0.1
Brain	Control	373.7 ± 21.5	381.1 ± 41.2	387.7 ± 39.1	377.7 ± 38.8	366.6 ± 40.0	352.1 ± 47.7
	Ethanol	359.3 ± 27.3	270.5 ± 31.0	253.5 ± 30.1	243.2 ± 25.5	241.9 ± 30.1	367.2 ± 50.3
	P	0.1	0.05	0.05	0.05	0.05	0.1

Each value in the table (Ug/g tissue) is mean ± s.e.m. (n = 5).

* Ethanol (40% v/v) was given at a single oral dose of 5 g/kg at 8:00 a.m.

Table 3: Glutathione (GSH) and ascorbic acid (AA) concentrations in tissues of mice treated orally with ethanol (5 g/kg) and the influence of cysteine pretreatment thereon.**

TREATMENT	LIVER		KIDNEY		BRAIN	
	GSH	AA	GSH	AA	GSH	AA
Control	1165.6 ± 63.5	739.3 ± 51.7	652.8 ± 42.7	487.3 ± 30.5	429.9 ± 29.3	383.7 ± 21.1
Ethanol	838.7 ± 80.1*	607.8 ± 59.3*	535.1 ± 34.8*	311.7 ± 32.9*	289.2 ± 31.1*	299.2 ± 30.7
Cysteine** + Ethanol	818.0 ± 84.6*	591.3 ± 62.1*	521.3 ± 21.8*	318.3 ± 41.3*	207.3 ± 29.2*	280.7 ± 29.1*

Values (in ug/g tissue) are means ± s.e.m. (n = 5).

** Cysteine (500 mg/kg) was injected intramuscularly 24 h before ethanol administration, and animals were killed 24 h thereafter.

* P < 0.05 (compared to control).

Evaluation of a Treatment Regimen Used in Complicated Appendicitis in Children at " Al Jala " Hospital , Benghazi

D. B. Gahukamble, Abdul Salam Khamage and L. D. Gahukamble

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الملخص

أجريت هذه الدراسة المستقبلية في مستشفى الجلاء « بنغازي » على حالات مصابة بالتهنم بعد عمليات استئصال الزائدة في (146) طفلاً تحت سن 12 سنة يعانون من غرغرينة أو ثقوب الزائدة . وكان خط العلاج الأولي هو استعمال ثلاثة مضادات حيوية معاً (الأميسيلين والجنتاميسين والميترونيدازول) مع غسيل محدود بمحلول ملحي خلال العملية . كانت النتيجة حدوث نسبة صغيرة جداً (5,6%) من التهنم داخل الغشاء البريتوني .. وأهتاج بسيطة في الجرح في 11,6% من المرضى وثبتت فعالية وأمان هذه الطريقة في هذا المستشفى .

SUMMARY

This is a prospective study from "Al Jala" hospital in Benghazi, of post-appendicectomy sepsis in 146 children, below the age of 12 years, with gangrenous and perforated appendix. The protocol consisted of administration of triple antibiotics (ampicillin, gentamycin and metronidazole) therapy and limited intra-operative saline irrigation. This resulted in extremely low rate (0.6%) of intraperitoneal sepsis and minor wound infections in 17 (11.6%) patients. The method was safe and effective in our hospital.

Introduction:

In recent years, advances in the management of acute appendicitis has eliminated sequelae and even mortality in this disease (4). However, the morbidity continues to be a problem, especially in childhood appendicular perforation. In this prospective study, our aim was to evaluate the use of combination of three antibiotics; ampicillin, gentamycin and metronidazole, along with limited intraoperative saline irrigation, to study its effects on post-appendicectomy septic complications in cases of advanced appendicitis in children in our hospital.

Patients and Methods:

During the period from June, 1985 to December 1987, a total of 676 children below the age of 12 years were operated on for appendicitis in "Al Jala" hospital, Benghazi. Of these, 146 (21.5%) patients had complicated appendicitis. The diagnosis of complicated appendicitis was made at the time of appendicectomy and later confirmed by histopathological examination. The records were maintained in a specially cyclostyled form. After appendicectomy, pus, debris and reactive fluid was swabbed and sucked out. A corrugated drain was

*DB Gahukamble and Abdul Salam Khamage, Department
of Surgery (Paediatric), Faculty of Medicine, Al Arab Medical University, Benghazi, Libya.*

*LD Gahukamble, Department of Pathology,
Faculty of Medicine, Al Arab Medical University, Benghazi, Libya.*

kept in the paracaecal region and was brought out through a separate stab wound. Further details of the protocol are summarised in Table I.

Table 1
The protocol for study of complicated appendicitis in children in "Al Jala" Hospital, BENGHAZI.

1. Quick resuscitation with intravenous fluids.
2. Intravenous administration of inj. ampicillin 50 - 100 mg/Kg body weight in divided doses given on admission.
3. Use of diluted savlon and spirit for skin preparation.
4. Lanz or right lower transverse abdominal incision for appendectomy.
5. After appendectomy, instillation of 200 - 300 ml of warm saline in paracaecal and pelvic cavity and suctioning it out.
6. Placement of corrugated drain in paracaecal region and exit of drain through a separate infraincisional stab wound.
7. Irrigation of the abdominal wound with warm saline prior to closure.
8. Immediate post-operative intravenous administration of gentamycin and metronidazole in divided doses.
9. Gradual switch over to oral fluids and then to normal diet. Continuation of antibiotics for 5 - 7 days.
10. Histopathological study of appendix.

Table 2
Post-operative outcome after appendectomy and Protocol treatment for complicated appendicitis in 146 patients.

Outcome	No. Of patients	(%)
No complications	127	(86.99)
Post-operative pyrexia	1	(0.68)
Pelvic phlegmon	1	(0.68)
Wound infections	17	(11.65)
TOTAL	146	(100.00)

Results:

Ninety five patients had gangrenous appendicitis, with or without perforation, while 51 appendices ruptured due to suppuration. 127 children did not develop any complications and were discharged from the ward. However, 19 patients had post operative complications. These are listed in Table 2. One patient had prolonged pyrexia post-operatively but detailed investigations showed no definite cause. He, however, recovered fully with continued use of antibiotics. Another patient developed pelvic phlegmon, the presence of which was confirmed by ultrasonography, which resolved also with continued use of antibiotics. Other patients had minor sutureline infections which responded to cleaning and dressing, but in one child a slight amount of pus discharge was noticed through the drain site. None of the patients had reoperation for complications. There were no deaths.

Discussion:

Al though, theoretically, many combinations of antibiotics can be used in cases of perforated appendicitis, the present choice of triple antibiotic therapy covers the wide range of usual microorganisms, including anaerobes, that are usually found in the suppurating appendix. Peritoneal saline lavage is increasingly used in cases of peritonitis although this procedure may lead to dispersal of bacteria throughout the peritoneal cavity (7) which was also shown by Hananian and Saddawi (3) in experimental animals. However, inoculation of bacteria in the peritoneal cavity, followed by peritoneal irrigation in dogs did not increase the mortality as compared to the other groups of dogs, where only inoculation was done but irrigation was avoided. Therefore, peritoneal irrigation per se does not increase mortality. On the other hand, irrigation of saline around caecal or pelvic region removes bacteria, infected, and faeculant matter. In our study we did not encounter any untoward sequelae after using the method described.

In children, the most serious sequelae, following appendectomy, are the abscesses which form in potential spaces in the peritoneal cavity due to the

presence of residual faecal matter and debris in it. A retained fecolith may be occasionally responsible (2). Prevention of these abscesses by using antibiotics alone is not sufficient and additional procedures are needed. One or two drains (5) placed in the peritoneal cavity could reduce the incidence of intraperitoneal sepsis, but all spaces cannot be drained effectively. The other procedure is to irrigate right iliac fossa and pelvis with saline. A retrospective study (1) showed that when intraperitoneal antibiotic lavage was used during the first 48 hours, following appendicectomy, the incidence of postoperative abscesses was reduced from 18% to 3% as compared to the other group in whom no lavage was utilized. Therefore, lavage with antibiotics has been an effective method in reducing the rate of intraperitoneal abscesses. In our study, we neither added the antibiotics to the lavage solution nor irrigated the entire peritoneal cavity. Our results were equally satisfactory and comparable to others (5) where the antimicrobial agent was added to the lavage solution. Only one patient in our series had residual pelvic phlegmon, which resolved without surgical intervention.

At present, the major cause responsible for the unacceptable morbidity in perforated appendicitis in children is post-operative wound infection as shown by many studies. In children, the incidence of wound infection range between 8% (4) to 35% (1) depending upon the methods of treatment. Since the offending organisms in wound infections originate in the peritoneal cavity, it is rational, therefore to use peritoneal lavage to reduce the incidence of wound infection. Although some authors (1) did not find reduction in wound infection after intraperitoneal antibiotic lavage, but later studies reported encouraging results. Stewart and Matheson (6) have shown that after using saline lavage containing tetracycline, the incidence of

wound infection fell to 8.6% as compared to 29.2% in its absence. Therefore, lavage definitely has contributed to the reduction of post - appendicectomy wound infection. This was also shown in our series. Although 17 (11.6%) patients developed superficial wound infections they were all minor and needed no further surgical procedures.

It can be concluded that the method used herein has eliminated the mortality altogether and has considerably reduced the occurrence of intraperitoneal sepsis in our patients. This method has also minimised infections in appendicectomy wounds in our hospital.

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Clinical and Dermatoglyphic Features in Libyan Children with Down's Syndrome

Nura Nasseb M. Balo, Nuri M. Shembesh and N. Gobha

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الملخص

أجريت هذه الدراسة ما بين شهري يناير 1990 م وديسمبر 1991 م في مستشفى الفاتح لطب الأطفال/بنغازي على (50) طفل مصابون بمتلازمة داون مع (50) طفل طبيعي لمقارنة الصفات المرضية وشكل البصمات في كلتا المجموعتين حيث شرحت بدقة . والغرض من هذه الدراسة كان لإيضاح تلك الصفات في كلتا المجموعتين ولإيضاح الصفة الشائعة إحصائياً في أطفال متلازمة داون التي أختيرت على أنها صفة خاصة للأطفال الليبيين المصابين بهذه المتلازمة . وقد قورنت تلك الصفات بالصفات المعروفة سابقاً بهذه المتلازمة في أنحاء أخرى من العالم فلم نجد اختلافاً يذكر فيما عدا قلة تبقع القرحة في العين وكذلك نقص السلامة الثانية في الخنصر وبعض التغيرات في بصمة اليدين .

SUMMARY

This study was conducted between January 1990 and December 1991 in "El-Fateh" Children's Hospital, Benghazi on 50 children with Down's Syndrome (30 Male and 20 Female) along with 50 normal children as a control group. Their clinical features and dermatoglyphic prints were described in detail.

The aim of this study was to evaluate the dermatoglyphic and physical features of the two groups to establish which were significantly more common in Down's Syndrome among Libyan children.

These features were compared with features of Down's Syndrome in other parts of the world. There were no significant differences except for a decreased frequency of brush-field spots, clinodactyly of fifth finger with some changes in the dermatoglyphic pattern of the III-interdigital area of both hands.

INTRODUCTION:

Down's Syndrome is the commonest chromosomal disorder encountered by paediatricians, and the most common single cause of mental retardation in children (9). Though this

syndrome is compatible with life, a considerable number of deaths occur during the neonatal period and early infancy, because of associated congenital anomalies and infection (10). A quick clinical diagnosis is some times not easy in the neonatal period, especially in areas where chromosomal

*Nura Nasseb M. Balo, Department of Lab.
Medicine (Cenetics Unit), Al Arab Medical University, Benghazi, Libya.
Nuri M. Shembesh, Department of Paediatrics,
Al Arab Medical University, Benghazi, Libya.
N. Cobha, Department of Paediatrics, Ministry of Health.*

analysis is not available. Further clinical features, which are characteristic of this syndrome, may enable recognition of cases as early as the neonatal period.

A strong correlation between dermatoglyphic prints and chromosomes was noted soon after the chromosomal basis for many congenital malformations was established (12). The dermatoglyphic print refers to those configurations formed by dermal ridges, not by flexion creases. The dermatoglyphic pattern of Down's Syndrome was found to be different from that of the normal population (5).

In 1957 Norma F. Walker described a scoring system which utilized the dermatoglyphic data in the diagnosis of Down's Syndrome (15) since then several diagnostic indices for Down's Syndrome have been advocated with varying degrees of success (1, 13).

This study was undertaken to document the clinical features and the dermatoglyphic pattern of Libyan children with Down's Syndrome.

MATERIAL AND METHODS:

This study was conducted between June 1989 - December 1990 in "El-Fateh" Children's Hospital, Benghazi. All babies born alive and suspected of having Down's Syndrome during that period were referred to the Genetic Clinic in this hospital. Fifty cases of Down's Syndrome, where the diagnosis was confirmed by chromosomal analysis, were selected for the study along with 50 age-and-sex-matched normal children as controls. A complete physical examination was carried out on each case and all physical signs were recorded. Palmar and Plantar prints were taken by Inkless methods (4). The dermatoglyphic print of the ten fingers tip, right and left III-interdigital area, right and left hallual area, position of ATD angle, and presence of simian creases, were recorded. Two sets of palmar prints were recorded with the finger fully abducted (for ATD angle measurement) and ATD was considered high if the distance between it and distal palmar crease was more than one-third of the length (16). The hallual area covering the tibial area of the ball of the feet was also printed. A 5X

magnifying lens with strong light was used for observation of the dermal pattern (2).

RESULTS:

Clinical features of children with Down's Syndrome and controls are shown in Table 1. Most of the features showed a statistically significant difference. Mandibular hypoplasia, skin fold post neck, clinodactyly of fifth finger, polydactyly, syndactyly, cleft-lip and undescended testis were found to be uncommon in patients of Down's Syndrome in Libya. Brush field spots, which showed statistically significant differences in the two groups, were not common among Libyan patients of Down's Syndrome. Only 16% had this clinical feature ($P < 0.01$). Surprisingly, clinodactyly was seen only in 8% of our cases ($P < 0.1$). Cardiac defects were found in 30% of cases of Down's Syndrome but in none of the controls.

The most common cardiac lesions were V.S.D. (60%), A.V. Canal (27%), A.S.D. (7%) and Fallot tetralogy (7%). One child (2%) had persistent pericardial effusion with associated hypothyroidism.

Dermatoglyphic patterns of children-with Down's Syndrome (49 non-dysjunction, one translocation) were composed with those of 50 controls (Tables 2 - 5).

The dermatoglyphic pattern of the right and left hand finger digits were nearly the same, the ulnar loop was the commonest pattern in most digits of Down's Syndrome and the control, except in the fourth digit; where whorl was the commonest pattern in the control group.

In both hands of Down's Syndrome patients and of controls, there was no statistical difference in the finger prints, except in the second finger where ulnar loop showed a significant difference ($P < 0.001$). Thus the ulnar loop for both right and left index finger is a characteristic feature in Libyan children with Down's Syndrome.

The commonest dermatoglyphic pattern of right and left III-interdigital areas was the vestige in 65% and 68% cases of Down's Syndrome, in right and left hand respectively, while it was seen in 22% and 28% of right and left hand in controls ($P < 0.001$).

The tibial arch the commonest dermatoglyphic pattern seen in the right and left hallucal area in 46% and 58% of the Down's Syndrome cases, respectively, while the diatal loop was the commonest pattern among the control group (52% and 48%) ($P < 0.001$).

Simian creases were found in 62% in right hand, in 76% of the left hand cases, of Down's Syndrome while none of the control had simian creases in right hand and only 4% simian creases in left hand.

ATD-angle was high in 80% and 76% of Down's Syndrome right and left hand respectively while it was low in both hands of the control group.

DISCUSSION:

The incidence of Down's Syndrome in Benghazi is approximately 1.8, per 1000 births (8) which does not appear to be different from the incidence in other parts of the world (7). In our series of 50 cases of Down's Syndrome there were no differences in clinical features as there are in cases observed in Western and Eastern countries (3), except for the dysplasia of middle phalanx (clinodactyly) on finger V of both hands. The presence of Brush-field spots were also less common among our patients. This fact had been noted by previous observers (8), and probably it is related to the colour of the iris (3) as most Libyans have brown irises. The incidence of hypothyroidism among our Down's Syndrome

is 2%, which is similar to incidence noted by Loudon et al in Glasgow, U.K. (11). This makes it mandatory to screen all cases of Down's Syndrome in neonatal period for thyroid function, especially in communities where thyroid screening is not a routine program as it is in Benghazi.

30% of our series have associated cardiac anomalies and the commonest lesions were V.S.D. (60%), and atrio-ventricular defect (27%) which is similar to other reports (6). Therefore, Doppler and Echocardiography screening for all cases of Down's Syndrome are advisable in the neonatal period for early diagnosis and early surgical correction of serious congenital heart disease. In our study of Dermatoglyphic pattern in Libyan Down's Syndrome, our findings were similar to those of others (13), except the right and left III-interdigital areas, where the vestige was the commonest dermatoglyphic pattern in our cases, while it was loop pattern in other studies (14). Other dermatoglyphic patterns revealed a highly significant difference between our Down's patients and the control group ($P < 0.0001$); so the ulnar loop in the right and left index finger, vestige pattern in right and left III-interdigital area, tibial rach in right and left hallux area with presence of simian creases and high ATD-angle in both hands are characteristic features of Libyan Children with Down's Syndrome.

Table 1: Clinical Features Present in 50 Confirmed Cases of Down's Syndrome and 50 Control.

Clinical Features	Confirmed case of Down's Syndrome		Control case	
	+	-	+	-
Upslanting palpebral fissures	47	3	0	50
Flat occiput	47	3	1	49
Third fontanellae	48	2	0	50
Epicanthic folds	48	2	2	48
Flat nasal bridge	40	10	2	48
Gap between 1st and 2nd toes	38	12	1	49
Hypotonia	35	15	0	50
Mandibular hypoplasia	31	19	1	49
Loose skin folds post neck	30	20	0	50
Cardiac lesions	15	35	0	50
Small ears	49	1	1	49
Hyperflexibility of joints	39	11	1	49
Brush field spots	8	42	0	50
Eye abnormalities	35	15	1	49
Clinodactyly	4	46	0	50
Polydactyly	1	49	0	50
Syndactyly	1	49	0	50
Cleft-lip	1	49	0	50
Undescended testis	2	48	0	50
Hypothyroidism	1	49	0	50

Table II. Comparison of Percentage Frequencies of Digital Pattern of Down's and Controls.

Right Digits

Pattern	V					IV					III					II					I				
	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.			
W	28	22	24	54	2	26	2	38	16	42															
U	70	76	72	40	96	70	98	44	80	58															
R	0	0	0	0	2	2	0	10	4	0															
A	2	2	4	6	0	2	0	8	0	0															

Left Digits

Pattern	V					IV					III					II					I				
	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.	Down	Con.			
W	22	14	36	58	8	22	4	28	22	36															
U	74	80	56	38	92	72	96	54	72	64															
R	2	0	4	0	0	0	0	6	4	0															
A	2	6	4	4	0	6	0	12	2	0															

W = Whorl; U = Ulnar loop; R = Radial lopp; A = Arch.

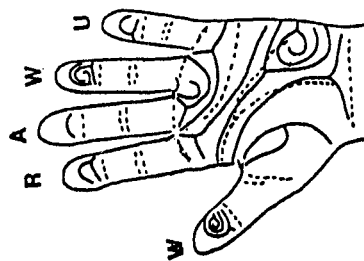


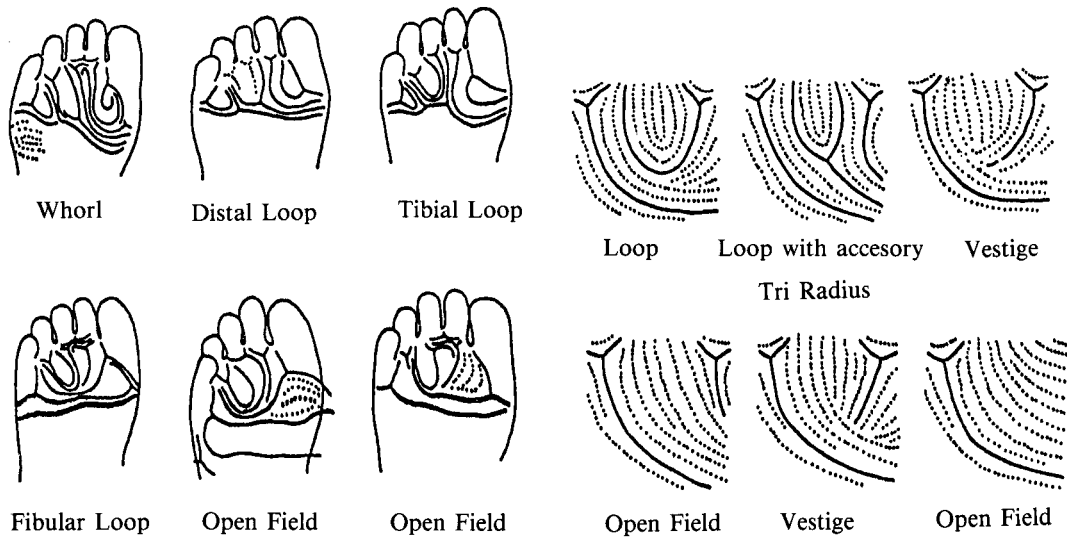
Table III. Comparison of Percentage Frequencies of III-Interdigital Area.

Pattern	Left		Right	
	Down	Con.	Down	Con.
	Loop (l)	22	14	26
Vestige (V)	68	28	64	22
Whorl (W)	0	2	0	2
Open filed (O)	10	56	10	46
Loop with accessory (D)	0	0	0	0

Table IV. Hallucal Area.

Pattern	Left		Right	
	Down	Con.	Down	Con.
T. Arch	58	0	46	2
S.D.L.	24	24	32	24
L.D.L.	8	24	12	28
Whorl	10	24	10	24
F. loop	0	4	0	4
T. loop	0	10	0	6
Open field	0	14	0	12

- T. Arch = Tibial arch.
- S.D.L. = Small distal loop.
- L.D.L. = Large distal loop.
- T. loop = Tibial loop.
- F. loop = Fibular loop.
- W. = Whorl.
- O. = Open field.



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" Accidental Poisoning of Children in the North-East Province of Libya "

M. M. Baccush and C. S. Nayak

(Recieved on 15th Nov., 1992)

الملخص

أجريت دراسة استرجاعية (RETROSPECTIVE) بوحدة طب الأطفال بمستشفى الزاوية الغربية (40 كيلو متراً غربى مدينة طرابلس) على حوادث تسمم الأطفال خلال خمس سنوات في الفترة من أي النار 1985 حتى الكانون 1990 م. وشملت الدراسة 271 حالة تسمم من واقع 3282 طفلاً دخلوا مستشفى الأطفال بالزاوية يعانون من مختلف العلل والأمراض. وقد أوضحت نتائج الدراسة أن معدل حوادث تسمم الأطفال خلال الفترة المذكورة بلغ 8.25% وكان هذا المعدل أعلى ما يكون أثناء سنة 1987 (10.26%) وأقل ما يكون في عام 1990 (5.46%). وأغلب حالات التسمم (56.83%) سجلت بين من هم أعمارهم 2 - 6 سنوات وبين الإناث (62%). وكان 52.4% من الأطفال قد تسمموا بمواد موجودة بالمنزل مثل الأدوية والعقاقير في 43.54% منهم وكذلك المنظفات الكيماوية. وقد سجلت أكثر الحالات خلال فصل الصيف (35.47%) وأثناء يومي الخميس والجمعة (22.5%) وبفترة ما بعد الظهر (2 - 8).

SUMMARY

A retrospective study of 271 cases of accidental poisoning was conducted at the paediatric unit of Zawia Central Hospital in North-Eastern province of Libya, over a five year period (From January 1986 to December 1990). The objective of the study was to identify the varied modes of poisoning in the paediatric age group, in order to plan suitable strategies to prevent them.

Study revealed that overall incidence of poisoning among children seen at the hospital was 8.25%. The highest incidence was observed in 1987 (10.26%) and the lowest in 1990 (5.46%). Majority of the cases (56.83%) were reported in the preschool age group of 2 - 6 years, and in females (61.99%). 52.40% of poisoned children consumed household products and poisoning by drugs occurred in 43.54% of the children.

The highest number of cases were reported during the summer season (35.42%), on weekends (22.50%), and during the afternoon period (between 2 - 8 P.M.).

MM Baccush and CS Nayak, Department of Family & Community Medicine,
Al-Fateh Medical University, Tripoli, P.O. Box No. 13229, Libya.

INTRODUCTION:

Accidental poisoning in children caused by potentially toxic substances, especially in the pre-school age group, is a global health problem through the world (3, 10, 14, 16, 17).

The poisoning pattern differs significantly from country to country; due to cultural practices, socioeconomic status, and living conditions. Various studies have revealed a clear distinction in the pattern and extent of poisoning among children in developed and developing countries, and this reflects attitudinal and behavioral differences (10, 11, 17).

A study on accidental poisoning in children conducted in Tripoli, Libya (1980) (1) revealed that poisoning due to kerosene ingestion was higher in children aged 2 - 5 years, in females, and during the summer season.

The present study in this area had the objective of identifying the varied modes of poisoning in the paediatric age group, to plan suitable strategies to prevent it.

SUBJECTS AND METHODS:

This study was conducted from the Central Hospital of Zawia province, which is situated in the north eastern part of Libya, about 40 km from Tripoli, on the coast. The hospital covers a population of about 20,000 in Zawia city and its adjacent areas.

All paediatric cases reported during the 5 years period (Jan. 1986 to Dec. 1990), as cases of accidental poisoning were reviewed in this study. The relevant data, including age, sex, type of poisonous substance consumed, seasonal variation, day and time of reporting to the hospital were gathered from patients files.

Poisoning in this context refers to all exposures to potentially toxic products.

RESULTS:

A total of 3282 cases were admitted to the paediatric unit of the Central Hospital, Zewia, during the study period, from which 271 (8.25%) cases were diagnosed as accidental poisoning.

The overall proportional morbidity rate due to

accidental poisoning was 8.25%, the highest in 1987 (10.26%), and the lowest in 1990 (5.46%) (see figure 1).

More than half (56.83%) of the cases were seen in preschool children aged 2 - 6 years, followed by children aged 6 - 8 years, (19.56%). The number of cases decreased as the age of children increased (see figure 2).

Overall accidental poisoning was significantly higher in females than males (61.99% and 39.48% respectively). Females were even more affected (74.40%) in preschool age group than males (65.42%), while children males had a higher percentage (34.58%) than females (25.60%).

More than half of the total affected children (52.40%) consumed household products; as potential poisonous substances, out of which hydrocarbons (Kerosene oil) was the leading cause (19.93%), followed by chlorine bleach (12.18%) (see table 1).

Drugs were the next most commonly consumed poisonous substances (43.54%). Unknown drugs caused poisoning in 15.87% of the total cases. Barbiturates (4.80%) and acetyl salicylates (4.06%) were the most common drugs involved.

The highest number of cases were reported during the summer season, especially from July to September (35.42%) as shown in figure (3).

Figure (4) shows that most cases of poisoning (22.50%) were reported on the weekend, Thursdays and Fridays (18.08%).

Majority of the cases (39.48%) reported to the Hospital during the afternoon (2 - 8 PM), followed by cases reported during the night (24.35%).

DISCUSSION:

This study revealed a higher proportional morbidity rate due to accidental poisoning in paediatric age group than other developing countries (2, 4), but lower than those for developed countries (6, 8). The study also revealed that proportional morbidity rate decreased from 1987 to 1990. It might be due to hospital admission policy and specific cultural practices.

Majority of the cases were reported in the age group 2 - 6 years. A similar finding was reported

from Benghazi (9) and from other countries (2, 8, 12). This age group has impulsive behaviour, curiosity, thoughtlessness and lack of experience that may account for this finding. Cases occurred less in the age group below 2 years that may be due to their limited mobility, and also less in children aged more than 6 years, as they are more discriminatory about what they swallow.

Household products are the most poisonous substances consumed by children in our study and in that reported from Benghazi (9) and the other countries (7, 15). Kerosene oil, which is used for cooking and heating purposes was responsible for the majority of the accidental poisoning cases in our study and in a study previously reported from Tripoli (1), but was reported in more cases from other developing countries (2, 4, 12), but in less cases from developed countries (5, 8). Colourless and non-standardized containers might be a contributing cause of Kerosene oil poisoning because it is easily mistaken for water.

Drugs constituted the next most poisonous substances consumed by children, as reported also from Benghazi (9) and from other countries (1, 2). Most medications are dispensed in loose paper envelopes rather than in child-resistant containers. Many of them without proper labelling. Careless storage of drugs at home may be another contributing factor.

Majority of the cases were reported during summer (July - September). Similar findings were reported from Tripoli (1). At this time the schools are closed and children spend more time at home, and have more chance to play and be active.

Thursday was observed to be a critical day for poisoning, followed by Friday. Most of the cases were reported in the afternoon, as observed by another investigator (13). At that time, most of the children come home from their schools. It may also be that cases that occurred in the morning hours were reported late because they were seen at primary health units first and then referred to hospital. Also most male members of the house are not available in the morning, being at work.

Education of parent and other caretakers of young children will help to reduce the morbidity

and mortality due to accidental poisoning.

Widespread use of child-resistant containers is necessary to combat the number of drug related poisoning. Drugs should be sold either in child-resistant reclosable containers or in dark-tinted unit packing. People should be educated regarding hazards and safe storage of all potentially toxic substances used at home and these products should be sold in childproof containers. The containers should be such that even if left open, only small amounts of substance can be dispensed at a time.

Regional poisoning control centers should be established for rapid identification, prevention, and treatment of accidental poisoning.

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Table 1: Toxic substances consumed as Accidental poisoning by children from Zawia Central Hospital (1986 - 90).

Poison Agent	No.	%
DRUGS:		
Barbiturates	13	4.80
Salicylates	11	4.06
Paracetamol	8	2.58
Chlordizipoxide	7	2.58
Steroids	6	2.21
Metronidazol	5	1.85
Aminophylline	4	1.48
Others	24	7.75
Unidentified drugs	43	15.87
SUBTOTAL:	118	43.54
HOUSEHOLD PRODUCTS:		
Kerosene	54	19.93
Chlorine bleach	33	12.18
Detergent	26	9.59
Insecticides	10	3.70
Others	19	7.01
SUBTOTAL:	142	52.40
PLANTS	11	4.0
TOTAL	271	100

PROPORTIONAL MORBIDITY PATTERN
OF ACCIDENTAL POISONING

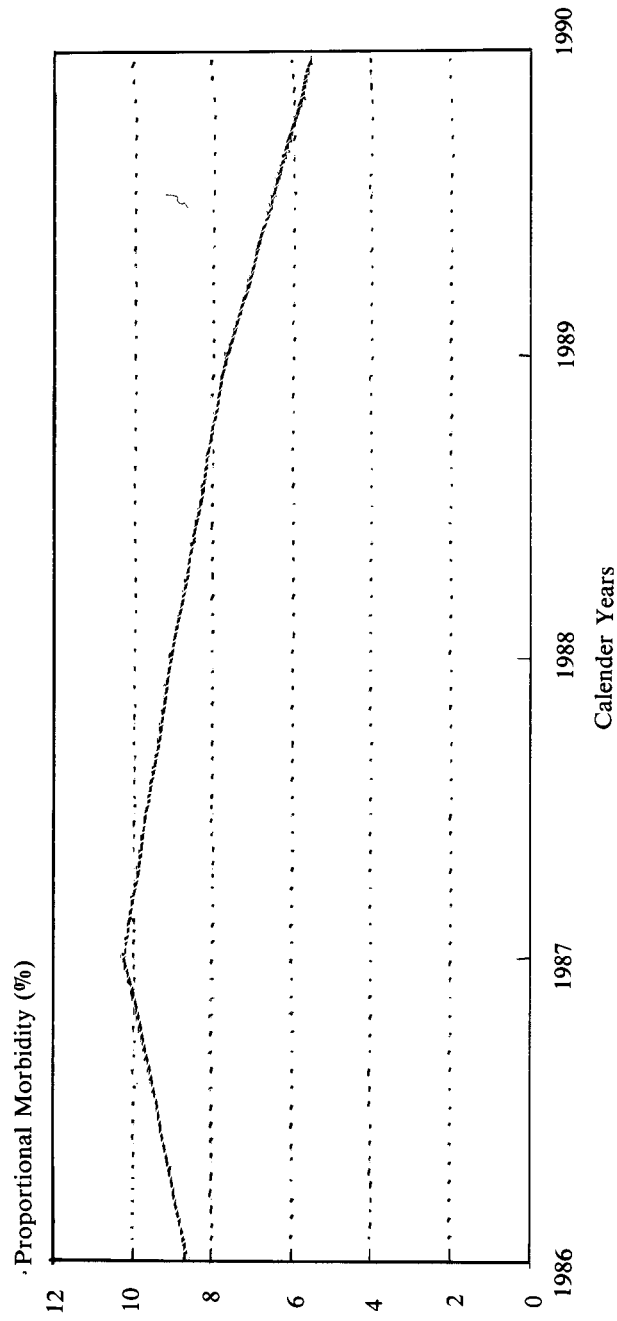


Fig. 1

ACCIDENTAL POISONING IN CHILDREN
IN RELATION TO AGE AND SEX

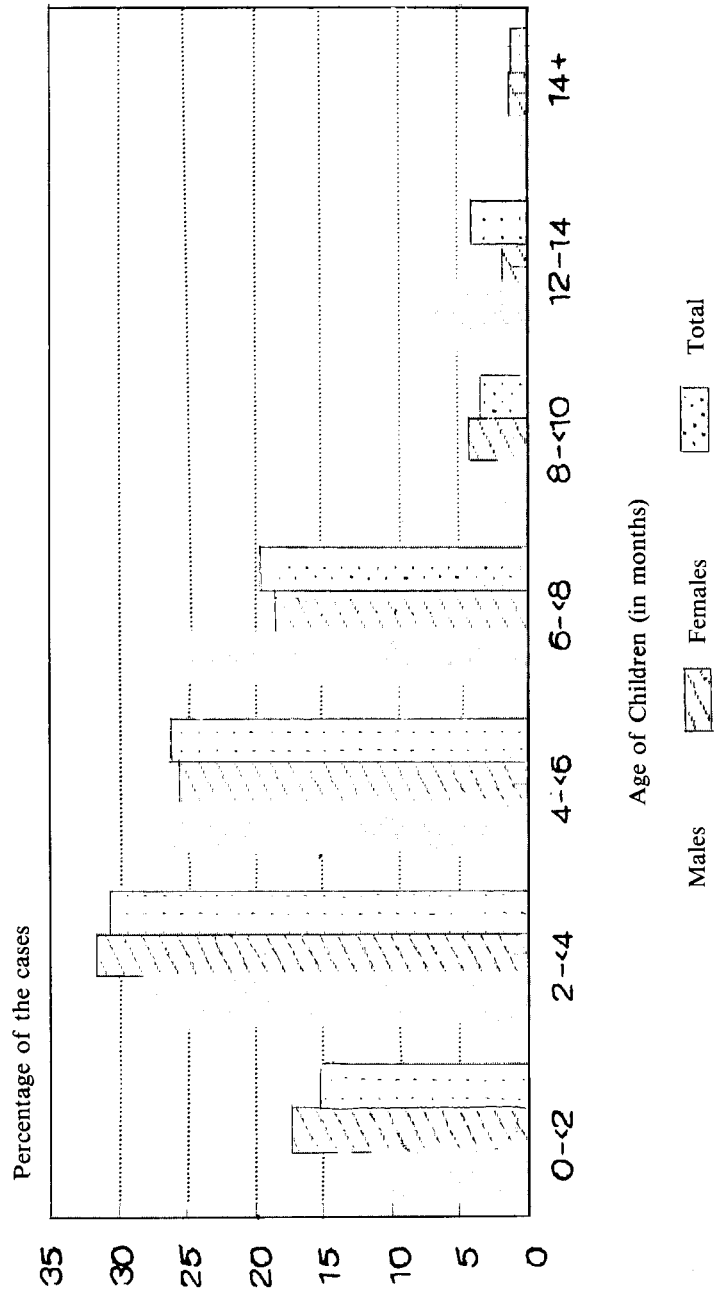


Fig. 2

ACCIDENTAL POISONING IN RELATION
TO SEASONAL VARIATION

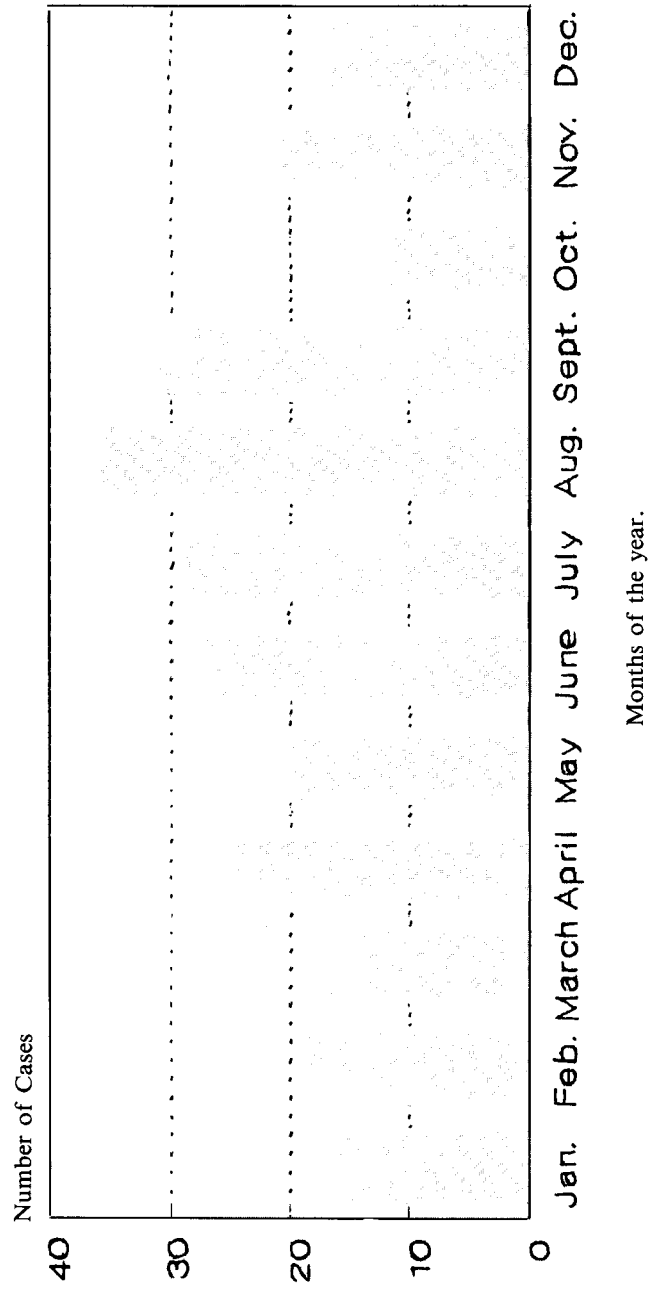


Fig. 3

ACCIDENTAL POISONING IN RELATION TO
DAYS OF THE WEEK

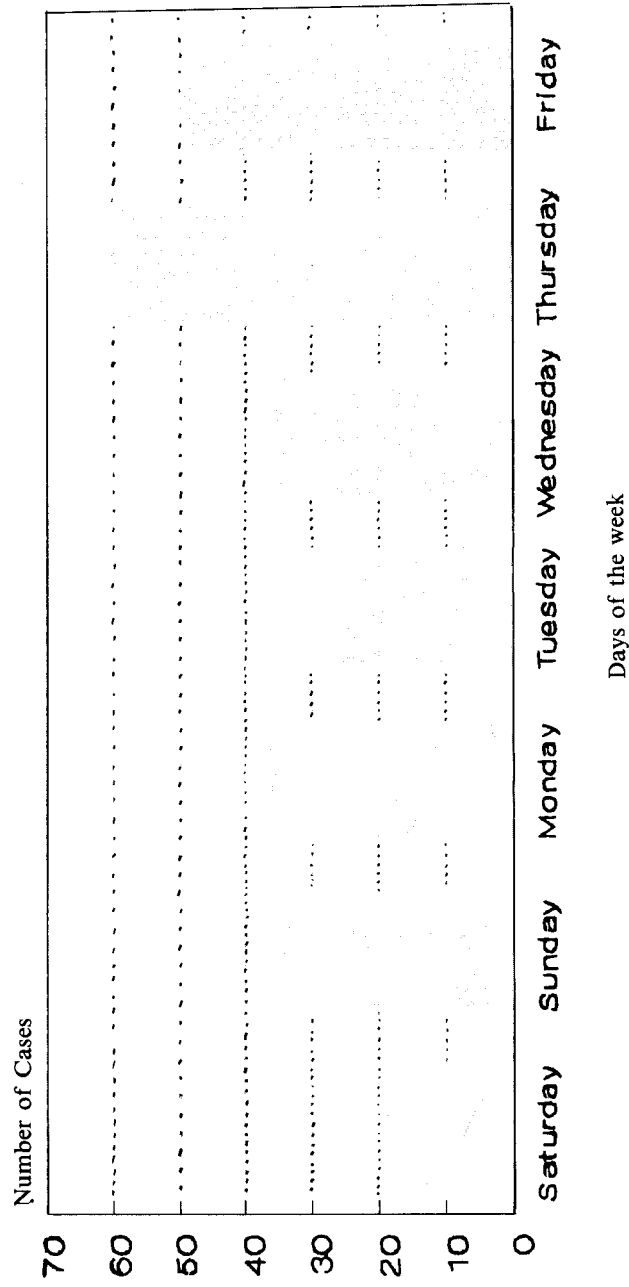


Fig. 4

ACCIDENTAL POISONING IN RELATION TO
DIURNAL VARIATION

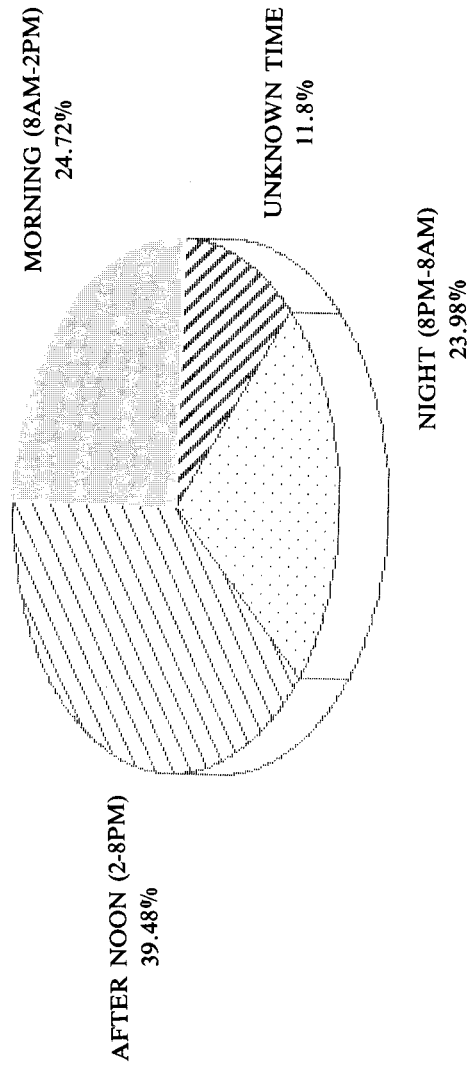


Fig. 5

Extra-Oral Sinuses : A Clinical and Microbiological Study from Benghazi

M. Said, I. M. Kashbur, S. Fahmy and M. El-Shikh

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الملخص

شخصت 39 حالة من الناسور الخارج من الفم . ويمثل ذلك نسبة حدوث تعادل 0,80% من كل حالات الإصابات الخمجية في الفم خلال عام كامل . تسوس الأسنان كان من أهم مسببات حدوث الناسور إلى جانب التهابات جذور الأسنان والعظام والكسور الفكية وغيرها . عزلت من هذه 39 حالة ناسور خارج الفم 78 جرثومة ، كان 47% منها لا هوائياً من جرثومة « البكتيرويد » ، بينما تسببت جراثيم متعددة ومختلفة في نصف الحالات . وأجريت على الجراثيم المعزولة اختبارات حساسية ضد المضادات الحيوية المستعملة في مثل هذه الحالات ولقد وجد أن « الأميسلين » وحده أو مع « الكلوكساسيلين » أعطى أحسن النتائج في معالجة الناسور بعد الجراحة وذلك في الالتهابات التي تسببها الجراثيم الهوائية . بينما كان « الأميسلين » مع « المترونيدازول » مؤثراً جداً على الالتهابات التي تسببها الجراثيم اللا هوائية .

SUMMARY

Thirty nine cases with extra oral sinuses, due to dental infection, were studied clinically and bacteriologically.

The incidence of extra oral sinus was found to be (0.80%) of all cases attending with oral infection over one year.

Males were more affected than females by the ratio 5:3, the most common were dental caries, periapical infections and remaining roots, impacted lower third molar, osteomyelitis, fracture mandible, infected periodontal cysts, infected dentigerous cysts, osteoradionecrosis. Management of such conditions started by clinical examination, bacteriological examination for the detection of pathogens and the determination of their antibiotic sensitivity.

*Seventy eight isolates were found in the specimens from 39 cases of extra oral sinuses that belong to 14 genera. Aerobes and facultative anaerobes formed 53% of all isolates, with **Streptococcus viridans** the most common isolates (35.9%). Anaerobes were isolated from 47% of cases with *Bacteroides* spp. commonest. About half the cases showed mixed infections. Antibiotic susceptibility tests showed that in aerobic infections, Ampicillin, either alone or with Cloxacillin, while in mixed infections, Ampicillin with Metronidazole,*

*M. Said and M. El Shikh , Faculty of Dentistry,
Al Arab Medical University, Benghazi, G.S.P.L.A.J.*

*I. M. Kashbur and S. Fahmy, Department of Microbiology,
Faculty of Medicine, Al Arab Medical University, Benghazi, G.S.P.L.A.J.*

and in anaerobic infections Metronidazole, were the most effective regimens used. Erythromycin was the second choice to Ampicillin in Penicillin-sensitive patients.

However, the main treatment of such patients depended on surgical intervention to remove the predisposing cause and to excise the sinus tract, followed by the antibiotic indicated by sensitivity tests on the isolated organisms. No recurrences were seen in all 39 cases which were thus managed up to 6 months after.

INTRODUCTION:

Incidence of suppurative orofacial infections have become low all over the world (3). Extra-oral sinuses are rarely seen nowadays due to greater awareness of oral hygiene among populations and early antibiotic treatment of suppurative infections (3). Extra oral sinuses have various origins and causes. Cervico-facial extra oral sinuses are commonly of dental origin due to specific infections such as actinomycosis, osteomyelitis or dental abscess.

Pus from an enlarged dentoalveolar abscess or chronic osteomyelitis lesion borrows along the path of least resistance in both hard and soft tissues. This may lead to the skin and thus to the formation of extra-oral sinuses (35, 36).

Patients usually seek treatment because of cosmetic considerations and to eliminate the persistent discharging sinuses. Management of these patients must be conducted through the cooperation of an oral dental surgeon and the bacteriologist to isolate and identify the causative microbial agent to ascertain the most effective antibiotic therapy (13, 18, 20).

Although the condition appears to be not uncommon, we found no reports on orofacial sinuses in Libya. The Department of Oral, maxillofacial surgery at the Al Arab Medical University is perhaps the only speciality center in the region dealing with oral and maxillo-facial problems. The present work involves cases from this department.

The aim of the present study is to determine the incidence, anatomic distribution, and surgical treatment needed for orofacial sinuses. Identification of the most common bacterial agents causing this lesion and their antibiotic susceptibility is also undertaken.

MATERIALS AND METHODS:

A. Patients and Methods:

Over a period of one year (October 1990 to September 1991), 4822 patients attending the Oral Surgery Department, Faculty of Dentistry, Al Arab Medical University, Benghazi, were examined prospectively for the presence of extra oral sinuses. Thirty nine patients with extra-oral sinuses were identified and included in this study. They are subjected to clinical examinations and both intra and extra oral radiography.

Treatment of these pathological conditions started after routine preoperative preparations. Patients were operated on either under local and/or general anaesthesia: surgical intervention by removal of the underlying pathological lesion, incision of the sinus tract by an extra oral elliptical incision and dissection of the sinus tract. The extraoral margins were undermined, chronic cat gut was used to close the subdermal tissues. All treated patients received antibiotic therapy according to the results of antibiotic sensitivity tests for the isolated and identified microbial agents.

B. Laboratory examination:

Pathological specimens for microbial examination were collected from 39 patients with extraoral sinus tracts, with or without outer discharge. Specimens were collected aseptically by ordinary swabs or deep aspiration of pus from the sinus tract using sterile 1 ml syringes filled with 0.8 m canulae.

Sinuses without discharge were scraped under local anaesthesia collecting tissue debris in sterile containers containing fluid transport media. All specimens were transported to the bacteriology lab of Arab Medical University, Microbiology Department within half an hour and inoculated

immediately on enriched culture media (Blood agar, Muller Hinton's agar) and incubated aerobically, anaerobically and in 5% CO₂ for up to 10 days. Direct stained smears from all specimens, using Gram's and Nigrosin (negative) stains, were also done.

Identification of aerobic and anaerobic bacteria isolated was carried out mainly to the level of genus, according to morphology, cultural characteristics and biochemical activity as described in Cruickshank 1978 (10). Antibiotic sensitivity tests, using the Kirby Bauer disc diffusion technique (3), was done on all isolates, aerobic and anaerobic, using the following discs: Ampicillin (10 µg), Erythromycin (5 µg), Tetracycline (10 µg), Clindamycin (2 µg), Cloxacillin (5 µg), Cephalothin (10 µg), Cephaloridine (5 µg), Tobramycin (10 µg), and Metronidazole (5 µg).

RESULTS:

A. Clinical results:

From 4822 patients examined, 39 (0.8%) had extraoral sinuses (males 25, females 14). Table 1 shows the occurrence in patients according to age and sex.

Predisposing causes of extra-oral sinuses among these cases are shown in Table 2. Periapical infection, including dental caries, remaining roots and trauma, accounted for more than half the cases (56.4%), followed by impacted lower third molars (8 cases) and fracture mandible (Fig. 1). As detailed in Table 3, thirty seven cases were on various sites on the lower jaw side (Fig. 2) while two cases were on the maxilla (Fig. 3). The mandibular orofacial sinuses are distributed around the face; 6 cases opened in mental, another 6 below the inferior border of the mandible and nineteen cases were in the cheek area opposite the lower premolar teeth. Also 6 cases were found just below angle of the mandible.

Clinically 29 cases were represented in the active stage and 10 cases in the quiescent phase. Treatment of these cases consisted of removing the underlying cause, sinus tract excision and proper antibiotic therapy, according to the results of antibiotic sensitivity tests. Cases were followed up for at least 6 months.

B. Bacteriological results:

From the 39 specimens processed, 83 bacterial isolates were identified and they were found belong to 14 different genera (see Table 4). Forty four isolates were aerobic or facultative anaerobes, while 39 were anaerobic bacteria. No fungal isolates were obtained from these cases. Among these 39 cases of orofacial sinuses 19 had mixed infections-aerobic and anaerobic-, 12 had aerobic infections and only 8 of them were infected with anaerobic bacteria (table 5).

Streptococcus viridans (33.9%), diphtheroids (25.6%), and *Staphylococcus aureus* (20.5%) were the most common aerobic isolates, while bacteroides species (51.3%) and fusiform bacteria (20.5%) were the most common anaerobic isolates.

The antibiotic susceptibility of these isolates are detailed in Table 6. Many of the aerobic/facultative anaerobic isolates were sensitive to ampicillin (72.8%), and 46.2% of the anaerobic bacteria isolated was sensitive to metronidazole. Antibiotic therapy was used in conjunction with surgical management of orodental sinuses, ampicillin and cloxacillin were the drugs of first choice, used in combination against infections by aerobic/facultative anaerobic organisms. Ampicillin in combination with metronidazole were the treatment of choice for mixed aerobic and anaerobic infections, providing that antibiotic sensitivity tests on the causative agents were in agreement. Erythromycin is used in cases of patient hypersensitivity to the penicillin. These regimens, following bacteriological sampling and antibiotic sensitivity tests, proved most effective in clearing the condition post-surgically. At six months of follow up, no recurrence was noted in any case.

DISCUSSION:

Extra-oral sinuses as a sequelae of infection processes in the oral cavity are not uncommon, and higher in developing countries (1). The present study revealed that the incidence of external sinus is 0.8%. A similar study was conducted among Indians and the incidence was 1.63% (30). Since these conditions do not apply in the more developed Western

hemisphere, we have the impression that the incidence of extra oral sinuses due to infection processes is still high in the developing countries (29).

Males were found to be affected more than females in this study. The ratio was nearly 5:3, this may be due to the higher level of awareness of oral and dental hygiene among females. This is in agreement with previous studies (23, 30). The orofacial sinus cases seen were commonest between the ages of 16 - 30 years. Carious activity is maximal at this time, and also third molars are erupting with associated pericoronal infection. This is corroborated by our findings which showed that the most cause of these sinuses is periapical infection arising as a result of dental caries, remaining roots, and trauma, while impacted teeth were the next most common cause (Table 2). Fracture of the mandible accounted for 3 cases, presence of badly decayed tooth with periapical infection, fractured root of a tooth in the line of fracture, improper reduction, are the main causes resulting in external oral sinuses.

The fracture line can become infected as result of any of the above, either from the oral cavity via the disrupted periodontum or directly from an infected pulp or periapical granuloma, and complication in the form of non-union and/or infection may result (19, 26). Teeth in the line of fracture should be carefully evaluated both clinically and radiologically. It is our observation that such teeth should be removed before complications appeared (19). Osteomyelitis accounted for 2 cases in our series. In the literature osteomyelitis was held responsible for causation of extra oral sinus in 17 cases reported by various authors (7, 14, 15, 18, 23, 26, 30, 31, 32). Osteomyelitis following radiation therapy for treatment of squamous cell carcinoma in floor of mouth accounted for one case. In our study infected periodontal cyst related to non-vital sites was responsible for 2 cases and infected dentigerous cyst, related to 3T3, was responsible for one case. Similar results were obtained in previous studies (23, 30).

The extra oral sinuses may be seen in different regions of the face. In our study the majority of cases were related to mandible and only 2 cases were

related to maxilla, Fernandez et al (11) also showed similar findings. This may be due to the reduced blood supply of mandible in relation to well-nourished maxilla. Also fractures occur more frequently in the mandibles than other parts of facial skeleton, and eruptions of lower third molars is usually accompanied by more problems, and osteomyelitis is usually common in the mandible (7, 15, 18, 23, 26, 30, 31, 32).

Diagnosis of external oral sinuses requires differentiation from skin infections, infected dermoid cysts, carcinoma, pyogenic granuloma, mycotic infection, foreign body reaction, osteomyelitis, and traumatic lesions (4). Kapis and Baker (22) reported from observation of 13 cases that these extra oral sinuses usually arise without dental symptoms and for this reason are often incorrectly diagnosed. Montgomery (25) published a case of chin fistula, diagnosed and treated unsuccessfully as a carcinoma. Therefore, it is wise to evaluate the dental condition of the patient before any other investigations and treatment. This will save effort and discomfort, for clinician and patient. In general, treatment should be aimed at removal of the underlying cause of the extra oral sinus (1). Some investigations support the idea that sinuses will often close without surgical intervention once the primary cause has been removed with proper antibiotic therapy (1, 4, 29, 30). It is our impression that in such cases, the treatment should include removal of the underlying cause of infection, together with the sinus tract, followed by proper antibiotics according to culture sensitivity tests. This will not only prevent recurrences, but removal of the sinus tract and clean closure of wound will result in minimum scarring and prevent the cosmetic complications of thickened and puckered skin. Follow up of our cases for six months showed that no recurrences were observed.

Most of the localised or progressive oral infections requiring antibiotic treatment occur endogenously, where oral flora and bacteria from dental plaque invade surrounding tissues. This may occur through diseased teeth, bone socket, or supporting tissues either accidentally or after trauma (6, 8, 13). Periodontal abscesses usually also are

endogenous in origin (6). A mixture of aerobic and anaerobic endogenous oral flora, such as **Streptococci**, **Peptococci**, **Actinomyces**, and **Bacteroides** spp. were shown by many workers to be common agents in orofacial sinuses of dental origin (20, 21).

The 83 bacterial isolates found in 39 cases of extra oral sinuses secondary to dental origin, were a complex mixture of either facultative aerobes, anaerobes, or both groups of organisms. The predominant isolates were **Bacteroides** and **Fusobacteria species** and the facultative anaerobic **Streptococcus viridans**. These organisms are the predominant oral flora and thus reflect the endogenous nature of these infections. These results are similar to those obtained by Kannaugara *et al.* who in 1980, studied the flora of 610 hospitalized patients with orofacial infections refractory to surgical treatment (20, 33). **Streptococcus viridans** and **Bacteroides** species are important isolates, since they are implicated in other serious pyogenic infections, such as brain abscess (28), subacute bacterial endocarditis and chronic meningitis (16). It is thus important that surgeons should not interfere with such oral infections without proper antibiotic therapy (20).

The high incidence of obligate anaerobes, especially **Bacteroides** and **Fusobacteria species** detected in our cases were not commonly detected in older studies (2, 3, 5, 20, 21, 28, 33) but have frequently been isolated in more recent studies from acute periapical abscesses. This probably reflects the better understanding of proper anaerobic techniques particularly sampling, rapid transport, and proper inoculation and culture of specimen (12).

Eight cases had **Staphylococcus aureus** present in their specimens as the predominant isolate. In three cases, pure cultures of **Staphylococcus aureus** were obtained. These three cases were previously exposed to repeated surgical interference. In the other five cases with Staphylococci, no anaerobes were present, however, **Haemophilus influenzae** was detected in three and diphtheroids in two. A similar incidence of pyogenic staphylococci from orofacial sinuses were isolated by Von Kono *et al.* in 1984 (33).

Gram-negative enteric bacilli are not commonly

isolated from dental lesions. Nevertheless, we could isolate **Pseudomonas aeruginosa** and **klebsiella** spp. from two cases each in this study. These cases were previously probed and received a type of impacted filaments, and infection by these organisms may have been thus introduced exogenously (9, 23, 32).

The antibiotic susceptibility studies on the bacterial isolates from these cases confirmed that ampicillin is the drug of choice, effective against most aerobic isolates. However, it is far less effective than metronidazole against anaerobic isolates. Erythromycin was the second most effective single antibiotic against both aerobic and anaerobic organisms isolated and thus it could be used as an alternative to ampicillin when patients are hypersensitive to penicillins (17).

Our results showed that the use of ampicillin, either alone or in combination with cloxacillin, was quite satisfactory to clear infections of extra oral sinuses caused by aerobic or facultative anaerobic bacteria. However, when pure anaerobes were isolated, metronidazole alone was found to be moderately effective. In cases of mixed infections with both aerobic and anaerobic bacteria, we could achieve a reasonable level of cure when a combination of metronidazole and ampicillin was used.

Clearly extra oral sinus infections have a complex and often mixed aetiology that mainly is due to the oral flora. Surgical treatment and removal of the predisposing primary dental cause is of paramount importance. However, antibiotic therapy plays a supporting role. They will not only inhibit the infective agents and enable the healing process to proceed, they may without any interference also prevent any further complications in dental patients as a result of bacteraemia during surgical manipulations (9, 16, 24, 28, 53). We are aware that the isolation and determination of the antimicrobial pattern of the infectious agent of the extra oral sinuses, may take too long to be of immediate help to individual patients, nevertheless, such results will help in developing a sensible rationale for management of such conditions. Such investigations will also reveal unusual aetiological agents, such as the gram-negative enteric bacilli or **Staphylococcus**

aureus which are identified in this study, and determine the most appropriate antibiotics to clear such infection.

Table 1: The distribution of patients complaining of orofacial sinuses according to age and sex.

Age group	No. of patients	No. of male	No. of female
5 - 15 years	11	7	4
16 - 30 years	15	8	7
31 - 45 years	7	5	2
46 - 60 years	4	3	1
> 61 years	2	2	—
TOTAL	39	25	14

Table 2: The incidence of cases with extra oral sinuses in both sexes due to different underlying cause.

Cause	Males	Females	Total	%
A. Periapical infection				
- caries	6	4	10	25.6
- remaining roots	4	3	7	17.9
- trauma	3	2	5	12.8
B. Impacted teeth	5	3	8	20.5
C. Fracture mandible	2	1	3	7.7
D. Chronic osteomyelitis	2	—	2	5.1
E. Osteoradio necrosis	1	—	1	2.7
F. Infected periodontal cyst	1	1	2	5.1
G. Infected dentigerous cyst	1	—	1	2.7

Table 3: Occurrence of 39 orofacial sinus cases according to their anatomical sites.

Anatomical location	No. of cases	% of cases
A. Mandible		
- medium mental	6	15.6
- below inferior border	6	15.6
- cheek	19	48.8
- below angle	6	15.6
B. Maxilla		
- Base of filtrum of upper lip	1	2.7
- below the body of zygoma	1	2.7

Table 4: Incidence of various species of 83 bacterial isolates from 39 cases of extra orofacial sinuses.

	Isolated from all cases (83)	Incidence of all isolates (%)	Incidence in 39 cases (%)
Aerobes/Facultative anaerobes:			
Streptococcus viridans	14	16.9	35.9
Diphtheroids	10	12.0	25.6
Staphylococcus aureus	8	9.6	20.5
Neisseria species	3	3.6	7.7
Streptococcus pyogenes	3	3.6	7.7
Haemophilus species	3	3.6	7.7
Pseudomonas aeruginosa	2	2.4	5.1
Klebsiella species	1	1.2	2.6
TOTAL	44	53.0	
Anaerobes:			
Bacteroides species	20	24.0	51.3
Fusobacteria	8	9.6	20.5
Peptococcus	5	6.0	15.4
Peptostreptococcus	3	3.6	9.2
Actinomyces species	2	2.4	5.1
Lactobacilli species	1	1.2	2.6
	39	47.0	
Number isolated from all cases	83	100%	

Table 5: The frequency of isolating single or multiple bacteria from 39 cases of extra oral sinuses.

Flora isolated	Number of cases out of total 39 (%)
4 genera isolated	3 (7.7)
3 genera isolated	10 (25.6)
2 general isolated	15 (38.5)
1 genus isolated	11 (28.2)
Mixed aerobic & anaerobic bacteria	19 (48.7)
Aerobic/Fac. anaerobic bacteria	12 (30.8)
Anaerobic bacteria	8 (20.5)

Table 6: Number and percentage of isolates sensitive to the various antibiotics tested.

Antibiotic tested	Aerobes/Facultative anaerobes	Anaerobes
	Total No. = 44	Total No. = 39
	Number (%) sensitive	Number (%) sensitive
Ampicillin	32 (72.8)	18 (46.2)
Cloxacillin	17 (38.6)	N.T.
Erythromycin	23 (52.3)	18 (46.2)
Clindamycin	16 (36.4)	13 (33.3)
Cephadrine	14 (31.8)	8 (20.5)
Cefalexin	10 (22.7)	6 (15.4)
Tetracyclin	0 (0.0)	0 (0.0)
Tobramycin	5 (11.4)	N.T.
Metronidazole	N.T.	32 (82.1)

N.T. = Not tested.

**Fig. 1:**Sinus tract on top of traumatic fracture of mandible.



Fig. 2: Sinus in mandibular area. (Right premolar).



Fig. 3: Frenular sinus (Apex of upper lip).

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Pattern and Causes of Tooth Mortality among Eastern Libyans

A. O. Dourda, M. S. Hamed and A. R. Mohamed

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الملخص

أجريت هذه الدراسة للبحث عن نوع وأسباب فقدان الأسنان في سكان شرق ليبيا ، تم إجراء 7606 عملية نزع أسنان على 6550 مريضاً . وكان هناك سببين أساسيين لنزع هذه الأسنان هما التسوس في 56,4% والتهابات حوالي السن في 31,9% والانحشار في 3,5% واستبدال الأسنان في 2,6% والتقويم في 1,3% . كان تسوس الأسنان أهم سبب لفقد السن في العقد الثاني والثالث والرابع من العمر ، بينما كانت التهابات ما حول السن هي السبب الرئيسي في العقد الخامس والسادس والسابع من العمر . كانت الأسنان الخلفية هي أكثر الأسنان المفقودة بالتسوس (47,7%) بينما كانت الأسنان الأمامية أكثر الأسنان المفقودة في التهابات ما حول السن (34,7%) .

SUMMARY

A study was conducted to investigate the pattern and causes of tooth loss among Eastern Libyans. A total of 7606 dental extractions were carried out on 6550 patients. The investigations revealed two major causes of tooth loss i.e. dental caries (56.42%) and periodontal disease (31.86%). Other important causes were trauma (3.68%), Impaction (3.54%), Prosthodontic causes (2.55%) and Orthodontic causes (1.31%). Dental caries was the main cause of tooth loss during the 2nd, 3rd and 4th decades, while periodontal disease was the prevalent etiologic factor during the 5th, 6th and 7th decades of life. Posterior teeth were the most extracted due to dental caries (47.69%) while anterior teeth showed the highest rate of extraction due to periodontal disease (34.65%).

INTRODUCTION:

There has been only one reported study on causes of tooth loss in the city of Benghazi in Eastern Libya, published 10 years ago (8). Because of the major socio-economic changes which has taken place in Libya since the publication of the first

study, it has become necessary to assess any changes in the pattern of tooth loss during the last decade. New knowledge gained from such a study can be very helpful in designing and implementing dental public health programs aimed at reducing the impact of orodental diseases on the society's well-being.

*Abdullah Omar Dourda, Conservative Dentistry Department,
Faculty of Dentistry, Al Arab Medical University, Benghazi.*

*Mohammad Said Hamed, Oral Surgery Department,
Faculty of Dentistry, Al Arab Medical University, Benghazi.*

*Abdel Rahim Mohamed, Oral Medicine Department,
Faculty of Dentistry, Al Arab Medical University, Benghazi.*

MATERIALS AND METHODS:

The Faculty of Dentistry serves as a referral center for the Eastern part of Libya. Between 1987 and 1990, 6550 patients ranging from 10 to 80 years and undergoing extractions at the Oral Surgery Department were randomly selected for this study. Diagnostic procedures were carried out, and indications for dental extractions noted for each case. Other informations such as age, sex, past and current medical history were noted.

RESULTS:

A total of 7606 dental extractions were carried out on 6550 patients, an average of 1.16 teeth lost per patient. The major causes of tooth loss fall into seven categories (Table 1). Dental caries and periodontal diseases accounted for more than 88% of all teeth lost. Loss due to dental caries was highest in the first three decades of life, however this percentage tapered off in subsequent decades (Table 2). Loss due to periodontal disease was seen at an age as early as ten years old and rapidly increased with age. However there was no loss due to periodontal disease in the first ten years of life.

AGE AND SEX DISTRIBUTION:

Tooth mortality was highest in the 2nd, 3rd and 5th decades of life (Table 2). 60.18% of total tooth loss occurred during these three decades of life. The average tooth loss per patient was approximately the same for both sexes. Female patients accounted for 50.73% of the total number of patients.

DENTAL CARIES:

Tooth loss due to dental caries constituted 56.42% of the total loss seen in this study. The teeth most frequently affected were the molars, whose loss accounted for 81.2% of all extractions due to dental caries (first molars 17.69% second molars 13% and third molars 15.51%). Anterior teeth loss due to dental caries amounted to only 8.67%, while the corresponding premolars loss was 10.13% (Table 3). Teeth lost due to extensive gross caries accounted for 58.99%, proximal caries 20.89%, occlusal caries 13% and cervical and root caries 7.12% from all caried teeth lost.

PERIODONTAL DISEASES:

Periodontal disease was responsible for the loss of 31.85% of all teeth in this study. Here again the molars were the most affected; 52.33% (20.31% first, 18.70% second and 34.65% third molars). Anterior tooth loss amounted to 34.65% with central incisors more frequently lost than other anterior teeth. Premolar losses were 13.02%, while dental caries was the most prevalent etiological factor for tooth loss during the first four decades of life among Libyans, periodontal disease was found to be the primary factor for tooth loss after the fourth decade of life.

TRAUMA:

Tooth loss due to trauma constituted 3.68% of the total, with the vast majority of teeth lost during the first ten years. Anterior teeth were the commonest teeth extracted due to trauma.

LOSS OF TEETH DUE TO IMPACTION, PROSTHODONTIC AND ORTHODONTIC PROBLEMS:

These three etiologic factors were responsible for only 7.10% of tooth loss. Tooth impaction involved largely the lower 3rd molar (63.60%) followed by upper 3rd molars (22.96%) and then upper cuspids (8.83%), Prosthodontically-related extractions occurred mostly during 4th, 5th and 6th decades and molars were the most affected teeth (73.9%). Extractions carried out for orthodontic purposes affected mostly premolars (71%), and usually during the 2nd and 3rd decades of life.

OTHER CAUSES OF TOOTH LOSS:

All other causes of tooth loss including hypoplasia, supernumerary teeth, cysts and attrition accounted for 0.65%.

DISCUSSION:

The present study indicated that causes of tooth loss among Eastern Libyans can be divided into major and minor causes. Dental caries and periodontal disease constitute the major causes, while trauma, impaction, prosthodontics problems, orthodontics problems, hypoplasia,

supernumerary teeth, attrition and cysts constitute the minor causes. These findings agree with other international similar studies (5, 3, 12, 11, 7). Where as Brekhus reported that caries and periodontal disease were responsible for 96.62% of extraction, Allen found that tooth loss due to caries and periodontal disease approximated 89.10% of all extractions in his study. A Nigerian study by Okoisor discovered that these two major etiologic factors accounted for 73.39% of all the people losing teeth up to the age of 60 years, and for 91.17% of those who needed extraction in the 7th decade of life. Another more recent Nigerian study of Odusanya found that tooth loss due to caries and periodontal disease accounted for 90.3% of total extractions. Another study in Scotland by Kay, et. al. reported that dental caries was the predominant etiologic factor of tooth loss in posterior teeth in the younger age group, while periodontal disease tends to affect anterior teeth in older patients. The combined percentage of teeth lost due to caries and periodontal disease were 71%. While our study agrees with Kay et. al that caries and periodontal disease were the major causes of tooth loss, however in our study, posterior teeth were more frequently extracted than anterior teeth due to periodontal disease. It is possible that poor maintenance of oral hygiene and difficulty in accessing posterior teeth for brushing and removal of deposits may account for this higher percentage of posterior, rather than anterior tooth loss due to periodontal disease. Earlier studies in Africa confirm that caries and periodontal diseases are the two major dental diseases of Africa (1, 13, 14, 9, 6, 4). While periodontal disease was thought of as the most widespread of all dental diseases, there were fears that dental caries was rapidly increasing (1, 6).

Our present study confirms that tooth mortality due to dental caries alone is quite high (56.42%). When comparing our results with the previously published study of Khalil et. al. (8) of ten years earlier, we observe that there has been some positive changes, as outlined in table 5. The apparent reduction in tooth loss due to dental caries in the present study compared to the Khalil et. al. study was most pronounced in the 2nd, 5th and 6th

decades of life (58% vs. 43.48% in Khalil's study during 5th decade, and 36.8% vs. 26.87% in Khalil's study during 6th decade). However, other age groups did not show any significant changes. Tooth loss due to periodontal disease, however, increased in the 2nd decade of life from 40% to 48.3% and 6th decade from 61% to 68.9%. There was an appreciable decrease in tooth loss related to periodontal disease during 3rd decade (from 4.8% to 2.6%) and 4th decade (from 13.3% to 7.86%).

This study shows predominance of dental caries as a cause of increased extractions of posterior teeth. This may be related to morphology of teeth, making them more prone to decay. However, patients are known to be more willing to have posterior teeth extracted (15, 10, 2) than anterior teeth.

It is likely that the dentist will be prepared to attempt complicated restorations and endodontic treatment in the more accessible anterior teeth. Thus, the greater longevity of anterior teeth may not be related solely to their increased caries resistant (7).

Previous reports have shown that the patient's sex has influence on the disease process affecting the teeth (7). In this study, the tooth loss pattern is not affected by the patient's gender. Minor causes of tooth mortality as shown by this study include trauma (primarily the result of car accidents), tooth impaction prosthodontic problems, orthodontic problems and other causes such as hypoplasia, over eruption, super-numerary teeth, attritions and cysts. These minor causes of tooth loss accounted for 11.73% of all losses. The lower third molars constituted 63.6% of tooth loss due to impaction, with acute pericoronal pain compelling the patient to visit the dentist. The vast majority of extraction for orthodontic reasons took place in the 2nd and 3rd decades of life. These findings are in agreement with another study on causes and pattern of tooth loss among Nigerians (11). Most extractions due to prosthodontic causes occurred in the 5th and 6th decades of life.

The results of this study suggest that although tooth loss due to dental caries remains high (56.42%), however, there has been some improvement in the pattern of tooth loss related

to dental caries over the last ten years. Tooth loss due to periodontal disease, on the other hand, appears to be on the increase, therefore, prevention programs should be considered of paramount importance if patients are to maintain healthy and functional dentition well into adult life. Premature loss of posterior teeth in Libyans could be considerably reduced by routine fissure sealing of carious teeth and by ensuring that Libyan population has an adequate fluoride ion intake as a part of credible comprehensive dental prevention program. Needless to say that as an integral part of such a program, a campaign should be initiated using the mass media to enhance the public awareness of the significance of maintaining good oral hygiene.

Likewise, periodontal disease could probably be reduced if regular brushing is stressed through an

awareness campaign and augmented by routine scaling.

TABLE 1. MAJOR CAUSES OF TOOTH LOSS.

Major causes	No. of tooth losses	Percentage (%)
Dental caries	4292	56.42
Periodontal Disease	2422	31.85
Trauma	280	3.68
Impacted teeth	269	3.54
Prosthetic Problems	194	2.55
Orthodontic Problems	100	1.31
Other causes	49	0.65
TOTAL	7606	100%

Table 2. CAUSES OF TOOTH LOSS IN RELATION TO AGE

ETIOLOGIC FACTORS	10 - 20 Y	21 - 30 Y	31 - 40 Y	41 - 50 Y	51 - 60 Y	61 - 70 Y	71 - 80 Y	TOTAL
Dental Caries	1022 71.46%	1426 85.07%	672 81.30%	454 43.48%	395 26.87%	309 33.11%	14 6.19%	4292 56.42%
Periodontal Diseases	30 2.09%	44 2.62%	65 7.86%	505 48.37%	1014 68.97%	561 60.14%	203 89.83%	2422 31.85%
Trauma	237 1.57%	35 2.08%	4 0.43%	4 0.38%				280 3.68%
Impacted Teeth	61 4.26%	115 6.85%	60 7.26%	19 1.84%	14 0.95%			269 3.54%
Prosthetic Problems		8 0.47%	10 1.21%	58 5.55%	46 3.12%	63 6.75%	9 3.98%	194 2.55%
Orthodontic Problems	65 4.54%	35 2.08%						100 1.13%
Other causes	15 1.08%	14 0.33%	15 1.93%	4 0.33%	1 0.09%			49 0.66%
TOTAL	1430 100%	1677 100%	826 100%	1044 100%	1470 100%	933 100%	226 100%	7606 100%

TABLE 3. TEETH MOST FREQUENTLY EXTRACTED DUE TO DENTAL CARIES

TOOTH TYPE	PERCENTAGE OF TOTAL EXTRACTION
1st MOLAR	
L	29.81%
U	17.88%
2nd MOLAR	
L	9.68%
U	8.32%
3rd MOLAR	
L	8.75%
U	6.76%
PREMOLARS .	
L	4.63%
U	5.50%
ANTERIOR TEETH (Central, Lateral incisors and Canines)	
L	4.03%
U	4.64%

L = Lower Jaw.

U = Upper Jaw.

TABLE 5. COMPARISON BETWEEN RESULTS OF PRESENT STUDY AND AN EARLIER STUDY REPORTED IN 1981

Causes of tooth loss	Khalil et al Stydi (1981) study	Present study (1991)
Dental Caries	65.6%	56.42%
Periodontal Disease	28.6%	31.85%
Trauma	1.5%	3.68%
Impacted teeth	2.4%	3.54%
Orthodontic Problems	1.4%	1.31%
Prosthodontic Problems	not reported	2.55%
Other causes	0.5%	0.65%

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Maxillary Arch Dimensions in Libyans

H. M. Faituri & V. Venkaiah

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الملخص

إن لكل عرق له خصائص وقسمات لوجه مثلاً الوجه شبه المنغولي والوجه الروماني ، هذا وإذا وضعنا الفك العلوي مع الفك السفلي سوية سيكون جزء مهم في تكوين المظهر الجانبي التجميلي إلى الوجه . هذا وإن أكثر أهمية في الوجه هو عظم الفك العلوي . إن شكل وحجم الفك العلوي ليس له نتائج على المظهر الجانبي للوجه بل يلعب دوراً كبيراً في المجال الفيزيولوجي (الوظيفي مثل الكلام والتنفس والمضغ) .

دراستنا شملت كبار الليبيين الذين تتراوح أعمارهم 13 - 16 والذين لهم مظهر جانبي طبيعي ، وكذلك إطباق طبيعي وارتفاع وطول وعمر طبيعي وقياس محيط القوس السنية . النتائج والتحليل والمناقشة ستكون حسب الجنس والعمر والعرق كل ذلك حسب هذه المتغيرات .

SUMMARY

Face has special characteristic features in each race; such as Mongoloid face, Roman face, etc.. The upper and lower jaws together form an important part in aesthetic profile. The most important bone of the face is Maxilla, whose shape and size not only affect the facial profile but also play a major role in functional aspects, like speech, breathing and mastication. This study was conducted among Libyans of 13 - 16 years of age, with normal facial profiles and dental occlusion to find the normal height, length, width and perimeter of the maxillary dental arch. The results are analyzed and discussed with reference to sex and racial variability.

INTRODUCTION:

Face has special characteristic features in each race such as in Mongoloids, Negroids and others. The size and shape of the facial arch not only affects aesthetics, but also plays a major role in functional aspects like mastication, breathing and speech. Variations in size and shape of the dental arches and teeth among different populations, and between individuals of the same population, is a common finding⁽¹⁻²⁾. Establishment of normal arch dimensions is necessary for the identification of

abnormalities. The present study is planned to find the normal maxillary arch dimensions among Libyans, as such information is lacking.

These norms are useful in routine clinical procedure practice of Orthodontics, Prosthetics and Oral Surgery.

Libya is situated in Central North Africa on the shores of the Mediterranean Sea. It links East and West Arab Countries and is a gateway which leads to Central Africa. The earliest reference to Libyans, as a name applied to a small group of tribes in

Cyrenaeca, is an Egyptian textbook of the second millennium B. C. Later Greeks extended it to all hamitic people whose physical and cultural characteristics distinguished them from Negro and Negroid people of Sudan⁽⁴⁾. These original Libyans were closely related to the longheaded, brown-skinned, dark-haired race that dominated in the Mediterranean basin at the end of the Old Stone Age (10,000 B.C.).

Since the beginning of its history, Libya had attracted many visitors as migrants or invaders, such as Phoenicians, Greeks, Romans, Vandals and Byzantines. Arabs came to Libya in the 7th century A.D. The original sedentary population swelled with the coming of Arab Benihillal and Benisaleim tribes by the 11th century. Most of the present three and a half million population is an admixture of different races that include Negroid, Africans and Caucasian stocks and are concentrated on the Mediterranean coast⁽⁴⁾

MATERIALS AND METHODS:

The material for this study consisted of 100 study models, with alginate impressions of Libyans of 13 - 16 years of age who had straight acceptable facial profiles. These individuals had a full complement of permanent teeth, of normal size, shape and occlusion. They also had Angle's Class I molar relation, proper proximal contact points between adjacent teeth without any crowding, spacing or openbite. There were two equal groups of 50 models of each sex.

The following individual measurements of different arch dimensions were made at intervals of three weeks, with Verniere calipers to the nearest 0 - 1 mm and Khorkhaus dividers.

1. HEIGHT OF PALATE: The central pit on the maxillary first molar is marked with a marking pencil on both sides. The maximum height of palatal vault is measured with Khorkhaus dividers, keeping the two pointed tips of the instrument in the central pits of the first molars on each side. (Fig. 2).

2. LENGTH OF THE DENTAL ARCH: Is the distance, measured with Khorkhaus dividers,

between the midpoint of mesioincisal angles of the central incisors on Labial surface and midpoint of right and left distobuccal cusp tips of the first molars. (Fig. 1).

3. ARCH WIDTH: This is the transverse measurement between the left canine tip and distobuccal cusp tips of first molar to corresponding landmarks on the right (Fig. 1) measured with Verniere Calipers.

4. ARCH PERIMETER: The distance measured from distobuccal cusp tip of the left first molar to canine tip to midpoint of a line joining the mesioincisal line angle of the central incisors on Labial surface and to the corresponding landmarks on the right side (Fig. 1).

RESULTS AND DISCUSSION:

Table 1 and fig. 3 (a-b-c) show measurements of arch dimensions of the subjects studied.

The height of the palate ranged from 15 mm to 21 mm in both sexes. (Fig. 2). The arch width (Fig. 1) between first molars, ranged from 44 to 56 mm in males and 43 to 54 mm in females. The arch width between canines ranged from 33 to 38.5 mm in males and 32.5 to 36 mm in females (Fig. 1). The arch length (Fig. 1) ranged from 32.5 to 40.5 mm in males and 33 to 40 mm in females. The measurement from molar to canine (Fig. 1) ranged from 26.5 to 31.5 mm in males and 27 to 31.2 mm in females. The measurement from canine tip to mid-point on Labial surface between two central incisors ranged from 18 to 21.5 mm in males and 17.5 to 20.5 mm in females (Fig. 1).

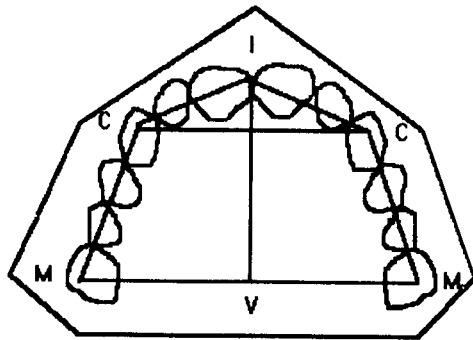
The difference in palatal height in both sexes is not statistically significant. The mean values of arch width at first molar, arch length and the measurement between first molar and canine tip are slightly higher in males than females, but mean values are not statistically significant. (Table 1).

The first molar is the first permanent tooth to erupt in the oral cavity and is considered to be the cornerstone of the dental occlusion⁽⁶⁾. Hence, the first molar is opted as landmark while recording archwidth and length. Arch width at molars in Libyans is similar to Caucasians⁽²⁾, Egyptians⁽⁵⁾

and Saudi Arabian population⁽⁵⁾, confirmed by the historical background of this country⁽⁴⁾.

The mean values of archwidth at canines and measurement between canine tip and midpoint of central incisors are more in males than in females which is statistically significant (Table 1). In light

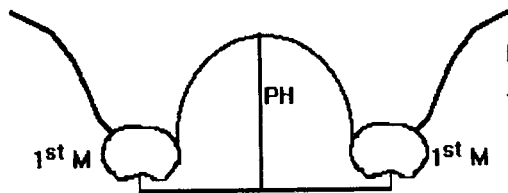
of the observation that the anterior teeth are larger in size in males than in females in Libyan population⁽³⁾, it may be concluded that the larger teeth require more space, hence, larger measurements of the anterior arch are found in males and vice versa in females.



1. I=Midpoint between upper central incisors.
2. C=Canine tip.
3. M=Disto buccal cusp tip of first molar.

Arch width [a] C-C: At canines.
 [b] M-M: At first molars.
 Arch length: I - V
 Arch perimeter: [a] I - C + C - M x 2

Fig. 1 Arch dimensions and points for measurements dental arch length and width.



PH = Palatal height
 1st M - 1st M = Central pits of first molars

Fig. 2 Points for measurement palatal height

TABLE 1. MEASUREMENT OF ARCH DIMENSION IN 50 FEMALE AND 50 MALE LIBYANS BETWEEN 13 AND 16 YEARS OF AGE:

PARAMETER	FEMALE			MALE			T-Value	P-Value
	Range in MM.	Mean	S.D.	Range in MM.	Mean	S.D.		
1. Arch width at first molars	43 - 54	53.01	1.972	44 - 56.5	53.44	2.562	0.95	N.S.
2. Arch width at canines	32.5 - 36	34.10	0.92	33 - 38.5	35.00	0.86	5.29	S P < 0.002%
3. Arch length	33 - 40	36.52	0.56	32.5 - 40.5	36.58	2.07	0.65	N.S.
4. Height of palate	15 - 21	16.46	1.24	15 - 21	16.46	0.969	0	N.S.
5. Inter-cusp distance (first molar & canine)	27 - 31.2	28.93	0.55	26.5 - 31.5	29.12	1.24	0.79	N.S.
6. Distance between canine tip to mid-incisor point	17.5 - 20.5	18.60	0.94	18 - 21.5	19.34	1.14	3.36	S P < 0.002%

* All measurements in millimeters

N.S. = Not significant

S = Significant

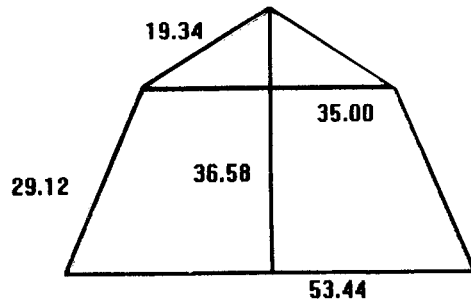


Fig. 3 (a): Normal Libyan male dental arch. dimensions

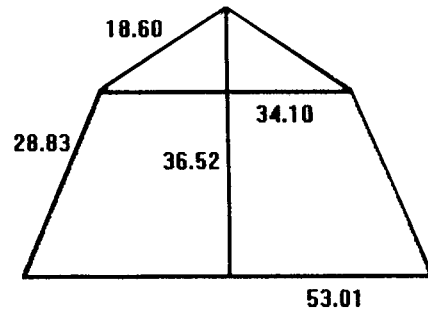


Fig. 3 (b): Normal Libyan female dental arch dimensions

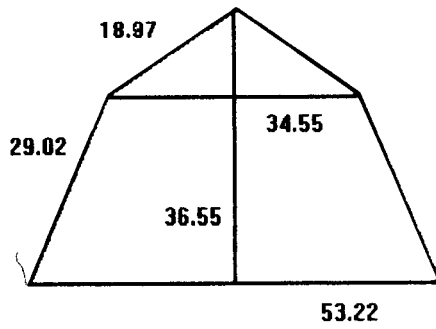


Fig. 3 (c): Normal Libyan dental arch. dimensions

CONCLUSION:

The present study is conducted among one hundred Libyans having all permanent teeth with normal occlusion, designed to find out the normal maxillary arch dimensions. There is significant difference in the arch width at canine region and the measurement between canine tip and the midpoint of the central incisors between males and females. There is no significant difference in the arch width at molars, arch length, palatal height and measurement between molar and canine tip between two sexes. These findings are very useful in Orthodontic diagnosis and treatment planning. The maxillary arch dimension plays an important role in facial aesthetics and normal occlusion. This dimension also determines the facial profile. The significant increase in the measurements of the anterior segment in male as compared to female in Libyan population is an interesting observation of the present study, which is not only important in

daily Orthodontic practice but opens up new channels for further study.

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Camel Erythrocytes in an Indirect Haemagglutination (IHA) Test for Human Hydatidosis

A. H. Khan, S. A. Kidwai and Rajaa S. M.

(Recieved April 25, 1992)

الملخص

تستعمل كرات الدم الحمراء من الأغنام أو الدجاج في معظم اختبارات التلازن المناعية في تشخيص الأمراض .

ولم يسبق دراسة صلاحية كرات دم الجمال في مثل هذه الاختبارات . من دراستنا في استعمال كرات الدم الحمراء من الجمال في تشخيص مرض الأكياس المائية بطريقة التلازن الغير مباشر وجد أنها أعطت نتائج أسرع وأظهرت نسب أعلى من تركيز الضدات بالمقارنة بكرات دم الأغنام في نفس الاختبار ...

Short title: Camel erythrocytes in IHA SUMMARY

Camel red blood cells (CRBCs) were used to prepare indirect haemagglutination (IHA) reagent whose sensitivity was compared with the reagent prepared from sheep red blood cells (SRBCs) for the diagnosis of human hydatid disease. CRBCs settled quickly and showed higher antibody titres than SRBCs in the IHA test in hydatidosis.

INTRODUCTION:

Sheep red blood cells (SRBCs) are commonly used in the indirect haemagglutination (IHA) test and generally found to be satisfactory for the serodiagnosis of parasitic infections. (13, 12, 4, 1, 7). Steele and Combs (19) and Pariza et al (17) have used human erythrocytes and the IHA reagent thus prepared was reported to be more sensitive.

Erythrocytes from different animal species, such as turkeys (18), geese (14), horses (19), monkeys and guinea pigs (15), rabbits, mouse and chicks (5) have also been used in IHA test. However, difficulties have been reported with rabbit, mouse and chicken cells (5) in the test system.

Several workers (20, 6, 16, 1) have used SRBCs in the IHA test for the diagnosis of human hydatidosis. In our previous study (3) we have used SRBCs and found that it is highly sensitive for the serodiagnosis of hydatid disease.

The aim of the present work is to prepare IHA reagent using camel red blood cells (CRBCs) and also to compare its sensitivity with the IHA reagent prepared using sheep red blood cells (SRBCs) for the diagnosis of hydatid disease.

MATERIALS AND METHODS:

Hydatid Fluid Antigen: Hydatid fluid was collected from the multiple liver cysts of *Echinococcus*

A. H. Khan, S. A. Kidwai and Rajja S. Mohamed,
Department of Microbiology & Parasitology,
Faculty of Medicine, Al-Arab Medical University, Benghazi, Libya.

granulosus of a local sheep as described earlier (3).

Serum Samples: Human serum samples were collected from 35 subjects which included 25 surgically-proven cases of hydatid disease (from Al-Jala and Al-Hawari Hospitals, Benghazi) and 10 normal healthy individuals (students of Medical Technology) with no signs or symptoms suggestive of hydatid disease. The antigen and sera were stored at -20°C until used.

Indirect Haemagglutination (IHA) Test:

IHA test was performed according to the method of Krupp (12) as modified by Kidwai et al (11) in Micro-titration plates (96 wells, U-shaped, Cooke, U.K.). Both sheep and camel erythrocytes were collected from the locally slaughtered animals and sensitized with the same sheep hydatid fluid antigen.

The optimum concentrations of crude sheep hydatid fluid antigen for the sensitization of sheep and camel erythrocytes were determined by checker-board titration. The camel reagent was lyophilized in glass vials and stored at -20°C as described earlier (3).

IHA titres below 64 were considered to be negative.

RESULTS:

Table 1 shows sensitization of fresh and glutaraldehyde stabilized camel red blood cells (CRBCs) with sheep hydatid fluid antigen. The optimum antigen (protein) concentration required for sensitization was found to be 160 µg/ml.

The sensitiveness of IHA reagents prepared with camel and sheep erythrocytes human hydatidosis cases are presented in Table 2. The titres observed by using camel cells were higher than those observed by using sheep cells in different serum samples.

Lyophilization did not alter the sensitivity of CRBCs and were found to remain stable for one month at -20°C. No false positive reaction was observed in any of the control negative sera.

DISCUSSION:

The locally derived hydatid fluid antigen has been found to be very useful for the serological diagnosis of human hydatidosis in Libya (2, 11, 2, 9, 10). This

study corroborates with these reports. Furthermore we have found that camel red blood cells (CRBCs) could not only be substitute successfully for sheep red blood cells (SRBCs) but also they are the better carrier particles for sheep hydatid fluid antigen than SRBCs in the IHA test for the serodiagnosis of hydatidosis.

Frashy and Kagan (4) reported that aldehyde treatment of erythrocytes enhanced the binding of antigen molecules to their surface. We too have observed that the treatment of CRBCs with glutaraldehyde facilitates the adsorption of hydatid fluid antigen on the cell surface. On the contrary the glutaraldehyde treatment of SRBCs did not improve the coating of antigen molecules on their surfaces (12, 8, 3) and the sensitivities of the IHA reagent prepared from fresh and glutaraldehyde treated SRBCs remained the same.

The CRBCs, treated with glutaraldehyde within 10 days after the collection of the blood and sensitized with antigen, were found to be stable for 10 days at a refrigerator temperature of 8 ± 2°C. Camel RBCs sensitized with antigen 10 days after stabilization posed problems in reading the agglutination pattern in that a clear-cut distinction could not be made between positive and negative serum samples.

In the present study it has been observed that a larger amount of antigen was needed to sensitize CRBCs, probably owing to the larger surface area of the cells. This cannot be considered a hurdle for using CRBCs, as the sheep hydatid fluid antigen is abundantly available, in this country. However, the IHA reagent prepared with CRBCs was found to be less stable than SRBCs..

On the other hand there are certain distinct advantages, that make us advocate the use of CRBCs in the IHA test for serological diagnosis of hydatidosis. Camel erythrocytes are less fragile than sheep erythrocytes and do not get haemolyzed during their processing. IHA titres observed by using CRBCs were distinctly higher than those obtained by using SRBCs in surgically confirmed cases of hydatidosis (Table 2). Further, two of the false negative cases, as detected by IHA reagent prepared with SRBCs, turned out to be positive with

significantly higher titres by IHA reagent with CRBCs. Which indicates the later reagent is comparatively more sensitive than the former. This might be due to large surface area of CRBCs, coated with antigen, provides more available reactive sites. They are heavier than SRBCs, hence settle quickly and enhance the speed of the test. They show more clear and definite haemagglutination pattern with positive serum samples.

Lyophilization study demonstrated that the IHA reagent is lyophilized and stored at -20°C , can be used for upto a month as ready made material in the IHA test for the diagnosis of hydatid patients. It would be more useful to study the cross reactivity

of the hydatid fluid antigen with other helminthic infections, which could be helpful to further characterize the specificity of the reagent. However, most of the other human larval cestodes and extra-intestinal nematodes are not endemic in Libya. The cross-reaction of hydatid fluid antigen with other endemic helminthic diseases in Libya will be studied in due course.

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Table 1. Checker board titration to determine optimum concentration of sheep hydatid fluid antigen for IHA test.

Antigen concentrations used for the sensitization of 1.5% suspension of camel erythrocytes.	Reciprocal IHA titres								
	PCHS (1)		PCHS (2)		HIRS		NCHS		
	CRBCs	CRBCs*	CRBCs	CRBCs*	CRBCs	CRBCs*	CRBCs	CRBCs*	
0 $\mu\text{/ml}$	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
10 $\mu\text{/ml}$	NIL	NIL	NIL	32	NIL	64	NIL	NIL	NIL
20 $\mu\text{/ml}$	NIL	64	NIL	32	NIL	128	NIL	NIL	NIL
40 $\mu\text{/ml}$	NIL	1024	NIL	64	NIL	512	NIL	NIL	NIL
60 $\mu\text{/ml}$	NIL	2048	NIL	64	NIL	1024	NIL	2	8
80 $\mu\text{/ml}$	NIL	2048	16	128	64	2048	2	8	8
160 $\mu\text{/ml}$	512	4096	64	512	512	4096	4	8	8
200 $\mu\text{/ml}$	512	4096	64	512	512	4096	4	8	8
250 $\mu\text{/ml}$	512	4096	128	512	512	4096	4	4	4

CRBCs = Camel red blood cells.

PCHS = Positive control human serum.

HIRS = Hyper immune rabbit serum.

NCHS = Negative control human serum.

* = Stabilized with 1% glutaraldehyde salt solution.

Table 2. Comparison of the sensitivity of glutaraldehyde stabilized sheep and camel erythrocytes sensitized with sheep hydatid fluid antigen in surgically confirmed cases of human hydatidosis.

Reciprocal IHA titres					
Serologically Positive*			Serologically Negative*		
No.	SRBCs (60 μ /ml)	CRBCs (160 μ /ml)	No.	SRBCs (60 μ /ml)	CRBCs (160 μ /ml)
1.	1024	4096	1.	16	42
2.	2048	4096	2.	32	32
3.	128	256	3.	8	32
4.	256	4096	4.	16	256
5.	512	4096	5.	32	256
6.	1024	4096	6.	8	2
7.	2048	4096	7.	32	32
8.	2048	64	8.	32	32
9.	2048	4096	9.	32	32
10.	2048	4096	10.	32	16
11.	64	64			
12.	64	64			
13.	1024	1024			
14.	4096	4096			
15.	2048	4096			

* = Hydatidosis cases positive or negative with IHA test using sheep red blood cells.

SRBCs = Sheep red blood cells.

CRBCs = Camel red blood cells.

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Otomycosis in Benghazi - A Prospective Study

B. Narasinga Rao, I. M. Kashbur, M. Subrahmanya Reddy and Samir Said Fahmy

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الملخص

درست مائة حالة من التهاب الأذن الفطري التي تم فحصها في عيادة (28 مارس) الخارجية التخصصية التابعة لقسم الأنف والأذن والحنجرة في بنغازي .
كان سبب الإصابة فطر واحد في 61% من الحالات وخليط في 39% منها وكانت نسبة إصابة الأذن بالفطريات 5,7% من بين جميع حالات التهابات الأذن الخمجية .
وحدثت معظم الإصابات في العقد الثالث والرابع من العمر أغلبها من الذكور ، وفي الأذن اليمنى ..
وكانت الحكمة أهم أعراضها .
تسبب الفطر « كانديدا » في 54,8% منها وخاصة « كانديدا البيضاء » بينما كان الفطر « الأسرجلية » في المرتبة الثانية (35,4%) ونسبة حدوث الفطور الأخرى « كالبنسليوم والريزوبية » قليلة .
عند فحص مسحات من الأذن الخارجية لمائة حالة أخرى غير مصابة بالتهابات الأذن للمقارنة ، ولم تعزل الفطريات إلا من عشرة حالات منها ، كان من بينها (6) فطريات من « كانديدا » و (3) فطريات من « الأسرجلية » وفطر « البنسليوم » في إحداها .
تناقش المقالة أهمية النتائج في علاج مثل هذه الحالات وتقارنها بنتائج دراسات عالمية أخرى ...

SUMMARY

This is a study of 100 cases of otomycosis seen at the out-patient department of Otolaryngology of "28th March" Polyclinic, Benghazi. Culture of the specimens from 95 cases yielded either a single fungal agent (61.05%) or more than one fungal agent as mixed infection (38.95%). The overall incidence of otomycosis in Benghazi was found to be 5.67%. Majority of the cases were in the 3rd and 4th decades of life (36% and 27% respectively). Incidence being more common in males (54%), the right ear being more frequently involved (58%). Itching was the main presenting symptom and complaint (69% of cases). Candida species (54.87%) were the most common isolates and included *C. albicans* (37.81%) as the predominant species, whereas *Aspergillus species* (35.4%) formed the second dominant species with *A. niger* (24.18%) as the major isolate. *Penicillium species*, *Mucor*, and *Rhizopus species* were also isolated but in a small proportion of cases.

B. Narasinga Rao and I. M. Kashbur, Department of Microbiology,
Faculty of Medicine, Al-Arab Medical University, Benghazi, Libya.

M. Subrahmanya Reddy, Otolaryngologist, 28th March Polyclinic, Benghazi, Libya.
Samir Said Fahmy, Faculty of Medicine, Ain Shams University, Cairo, Egypt.

*Among these cases, bacteria were isolated from 68 cases. The common organism being **Staphylococcus aureus** (29.32%) followed by **Pseudomonas aeruginosa** (18.1%) and **Staph. epidermidis** (12.08%). A hundred normal healthy controls were also studied for the presence of fungi and bacteria in their external auditory canals. In these, only 10 isolates of fungi were identified, which included 6 isolates of **Candida** species, 3 isolates of **Aspergillus niger** and a single species of **Penicillium**. Bacteria were also isolated, and the predominant bacteria flora in this group were mostly nonpathogenic, in contrast to the potential pathogens isolated from cases of otomycosis. Their role in the causation of otomycosis is discussed. Our results are also compared with the results of other workers in different parts of the world.*

INTRODUCTION:

Chronic infective disorders of the ear remain a common source of misery for patients and frustration for doctors. Otomycosis is one of the most common conditions encountered in ENT and general practice. Although it is sometimes dismissed as a simple disease, easily amenable to treatment, there is increasing concern due to the difficulty of eradication and frequent recurrence of the condition.

Meyer (19) first described otitis externa in 1884. It is still debatable whether fungi are primary infectors of the external auditory canal, or invade the skin only once it has been violated by bacterial toxins (8). Many laboratory and clinical studies have shown that otomycosis is a definitive clinical entity and a continuing problem (21, 30).

Otomycosis has been described in the literature as a fungal infection of the external auditory meatus and ear canal (Otitis externa) characterised by exudative inflammation and pruritis from which a number of fungi and bacteria can be isolated (7).

The diagnosis can be made immediately with otoscopy if a thick mycelium is seen covering the canal skin, classically described as a membrane that looks like "blotting paper" or "wet newspaper" covering the canal skin and sometimes the tympanic membrane. This superficial layer usually separates, leaving red tender skin underneath. Biopsy and microscopic examination of the material shows separation at the level of the dermal-epidermal junction with fungal hyphae invading the epithelium (4).

Mycotic infection of the external auditory meatus is prevalent in tropical and subtropical climates. The

incidence in temperate climates is increasing in association with increase in use of antibiotics to which fungi are resistant (5).

Most patients suffering from early otomycosis complain of severe itching. This usually progresses to pain, hearing loss, and less frequently aural discharge.

Warm, humid climate predisposes to otomycosis. Some authors attributed the greater frequency of otomycosis in the tropics to a change in the composition of cerumen that results from increased sweating (4). Cerumen is thought to help protect against the overgrowth of microorganisms in the ear canal. However, Ferguson (10) has recently shown that cerumen can actually promote the growth of fungi in vitro.

Oliveri (23) studied a series of Sicilian patients with otomycosis and found that apart from climatic conditions, instrumentation of the ear was the greatest risk factor for the development of the disease. Bathing in salt or fresh water and previous topical therapy were not mentioned in that study as significant risk factors. Recent studies showed that the higher incidence of otomycosis does not appear to have been reduced by the widespread use of potent topical or systemic antibiotics and steroids (21, 24).

The present study was undertaken to find the incidence of otomycosis in Benghazi and the profile of various fungi in random samples of otomycosis cases. The coexisting bacterial flora in these cases were also studied along with the normal healthy controls. We envisage that the results of the present study will help the otologist decide the most appropriate treatment for such cases, especially

when culture may not be possible, as most of these are out-patient cases.

MATERIALS AND METHODS:

One hundred cases of otomycosis, attending the out-patient department of otolaryngology at "28th March" Polyclinic, Benghazi were selected at random for the present study among a total number of 223 patients attending for treatment of otomycosis during a period of one year (from 1st December, 1990 to 31st November 1991). The cases were clinically diagnosed by otoscopy and on the basis of failure of routine treatment to relieve a diffuse otitis externa, with continued irritation in the ear and rapid reforming of a mass of debris in the meatus after cleaning (5).

Material was collected from the external auditory meatus with a sterile cotton swab from the affected ear, inoculated, immediately on a Sabourauds glucose agar medium (OXOID), and incubated for 2 weeks at room temperature (20 - 26°C). Fungal growth was observed on the 3rd day, 7th day and at the end of the 2nd week before cultures were discarded. Each swab was also inoculated on Blood Agar and MacConkey Agar plates and incubated aerobically at 37°C for 24 hours and 48 hours for any possible bacterial growth. Both fungal and bacterial isolates were identified on the basis of their cultural, morphological and biochemical reactions using standard procedures (6, 7, 15).

Ear swabs were also collected from a 100 normal healthy individuals (50 male and 50 female medical students, with no history of ear problems) as normal controls and were subjected to culture as described earlier, for any possible fungal and bacterial flora.

RESULTS:

Table 1 shows that 63% of the cases of otomycosis occurred in the third and fourth decades of life. The incidence below 20 years was 17%, while only 20% of cases were above 50 years old.

There were slightly more cases in males than females (54% and 46% respectively) but this difference was not significant (Table 1).

The right ear was found to be more affected than the left ear (58% and 32% respectively), while

bilateral (both ears) infection was observed in 10% of cases (Table 2).

As can be seen from Table (3), itching was the most common presenting symptom and complaint in this study (69%), followed by pain (62%) feeling of some mass in the ear (52%), hearing impairment (34%) and discharge (28%).

The present study clearly demonstrated a high incidence of *Candida* species (54.87%), as the main isolates in otomycosis with *C. albicans* being the dominant species, followed by *Aspergillus* species (33.4%), with *A. niger* outnumbering the other species. Few cases of *Penicillium* species (4.43%), *Rhizopus* species and *Mucor* species (2.25% each) were also isolated (Table 4). No growth was observed in 5 out of the 100 cases studied.

A single fungal infection was found in 61.05%, and a mixed infection (with more than one fungal species) was identified in 38.95% of our patients.

Bacteria were isolated in 68 cases of otomycosis and the prominent colonizing bacterial isolates were of *Staph. aureus* (29.32%) followed by *Pseudomonas aeruginosa* (18.1%) (Table 6).

The frequency of fungal and bacterial colonization of external ear in 100 normal healthy controls is shown in table 7 and 8. The fungi isolated from these normal controls included 6 isolates of *Candida* species, 3 isolates of *Aspergillus* species and a single isolate of *Penicillium*. The predominant bacterial isolate was *Staph. epidermidis* (43.96%) followed by *Staph. aureus* (20.88%) and Aerobic spore bearing bacilli (15.38%) .

DISCUSSION:

The number of patients who attended the outpatient department of Otolaryngology at "28th March" Polyclinic during the period between 1st December 1990 and 30th November 1991 was 12633; of these 3933 (31.13%) had ear disease. Otomycosis was diagnosed in 223 of these cases which constituted an incidence of 5.67% of all ear conditions, and 1.77% from the total Otolaryngology cases.

Otomycosis has a worldwide distribution with a higher prevalence in the tropical and subtropical regions. A high incidence was reported by some

workers; 54% in Burma (32), 20% in Australia (26), whereas in certain parts of India it was 6.2% (1). In the U. K. the incidence was 8.7% (21). An incidence of 5.6%, was observed in the present study in Benghazi which appears comparatively low in a subtropical climate like in Libya. Conant et al (7) expressed the opinion that not more than 15 - 20% of ear infections were true otomycosis. The majority of fungi isolated were generally considered to be saprophytic in nature and can commonly be isolated from the normal, healthy, glabrous skin (25). Haley (12) reported the isolation of 24 different species of fungi from 216 normal external auditory canals that she examined, and observed that many of the species isolated were similar to those found in infected ears. Lea et al (16) isolated saprophytic fungal species from 27% of healthy auditory canals examined and found that *C. albicans* was present in 3 of the 127 ears studied. Fungi isolated from pathologic lesions of the ear were usually present as saprophytic organisms (14, 31). Other workers from India (2) also reported the isolation of these saprophytic fungi from the ears of 50 healthy normal controls (4 strains of *A. niger* and one strain each of *A. fumigatus* and *C. albicans*). In the present study 6 isolates of *Candida* species, 3 isolates of *Aspergillus niger* and one strain of *Penicillium* species from the ears of 100 normal healthy controls were identified (Table 7).

In 1844 Mayer (19) detected the presence of fungal elements in the discharge from an infected ear and suggested that infection of the external auditory canal is commonly caused by fungi (20, 28). This concept has been debated until recently when further observations have afforded an opportunity to define more precisely the etiology of ear infection and the exact role played by fungi (11, 25, 27). It is now considered to be a definite clinical entity and a continuing problem (21, 30).

The part that these fungi play in production and maintenance of pathological lesion and the factors that permit them to grow profusely under certain environmental conditions were obscure (25, 27). It does appear, however, that when the normal physiology of the external auditory canal is distorted by trauma, operation procedures and underlying

disease processes such as eczema, seborrhea, psoriasis or infections caused by certain bacteria, a favourable environment for fungal proliferation is created (9, 14, 20). Some authors have attributed the greater frequency of otomycosis in the tropics to a change in the composition of cerumen that results from increased sweating (4). In the past cerumen has been thought to help protect from overgrowth of microorganisms in the ear canal. However, Ferguson (10) has recently shown that cerumen can actually promote the growth of fungi in vitro.

In the present study, among the cases examined, the incidence was slightly, but not significantly, higher in males (54%) than in females (46%), and more in the 3rd and 4th decades of life (Table 1). Similar observations were made also by other workers (2, 21, 24). The high incidence in young and middle aged males was probably because they are more exposed to environmental dust than females as they go out to earn their livelihood (2). In the present study, the right ear involvement was more than the left ear (58% and 32% respectively) (Table 2). This finding was observed also by other authors. This may be the result of contamination of the right ear by the right hand since most people are right-handed (2).

The main presenting symptom was itching seen in 69% of patients in our study, followed by pain (62%), feeling of some mass in the ear (52%), hearing impairment (34%), discharge (28%) and tinnitus (1%) (Table 3). Similar findings were reported by other authors (24). The development of external otitis was associated with local itching which coincides with proliferation of the organism in the external auditory canal and was followed by the progression of the condition to produce varying degrees of pain and a clinical picture of mild to severe degree of inflammation associated with serous discharge (29).

From a total of 100 clinically diagnosed cases of otomycosis selected for the present study, 95 cases yielded one or more fungal isolate each, and a total of 113 isolates. *Candida* species were predominant (54.87%) followed by *Aspergillus* species (33.4). *Candida albicans* was the commonest (31.87%)

among candida species and *A. niger* (24.78%) among *Aspergillus* species. A few species of *Penicillium* (4.43%), *Rhizopus* species and *Mucor* species (2.65% each) were also isolated in our study (Table 4). Different authors reported different incidences of fungal isolates in their study (Table 9). Some workers reported candida species as the predominant isolate with *C. albicans* as a dominant species in their study (21, 22, 33), which agrees with our results. *Aspergillus* species was the second major isolate in our study but other authors reported *Aspergillus* as the predominant species in their study (1, 2, 3, 17, 24, 32) with *A. niger* as dominant species. A small percentage of otomycosis due to *Penicillium* species, *Mucor* and *Rhizopus* species were also reported by various workers (2, 3, 17, 18, 21, 24).

Single fungus infections were seen in 61.05% and multiple fungal infections in 38.95%. Table 5 compares our results with those from studies reported elsewhere (24).

Among the bacterial isolates *Staph. aureus* formed the predominant isolate (29.32%) both with single and mixed fungal infections, *Pseudomonas aeruginosa* (18.1%), *Staph. epidermidis* (12.08%) and *Micrococci* (11.2%) (Table 6). These findings were in accordance with the results of other workers elsewhere (2, 21, 24). From these observations it can be concluded that pathogenic bacteria probably play a definitive role in the causation of otomycosis, possibly by changing the conditions in the external

auditory meatus in such a way that fungi (or their spores) that merely present in the ear canal become more involved in the pathological changes in the meatus leading to various signs and symptoms of otomycosis (2).

In the present study, 91 bacterial isolates were identified in 100 normal healthy controls with no previous history of ear disease (50 male 50 female medical students) in which *Staph. epidermidis* (43.96%) was the predominant isolate followed by *Staph. aureus* (20.88%) and aerobic spore bearing bacilli (15.38%) (Table 8). The patients who had recurrent attacks of otitis externa, had primary infection with super added bacterial pathogen. Antibiotic treatment will clear up the bacteria, but the fungal infection will not be eradicated and may even flourish (5, 13). Similar findings were also observed by other workers (2).

This study showed that *Candida* species are the most common isolates from otomycosis in this part of Libya (in over 50% of cases), so one can reasonably treat cases of otomycosis with appropriate anti-candida agents when culture facilities are not available. It is also conceived that fungi as normal flora or as infectious agents in subclinical state, may create problems during the post operative healing process. We, therefore recommend routine screening for fungi for all patients subjected to micro surgery or any other surgical procedures in the ear.

Table 1. Age and Sex incidence of otomycosis in 100 cases from Benghazi.

Age (in years)	Male (Number)	Female (Number)	Total Number (%)
0 - 10	2	1	3 (3.00)
11 - 20	4	10	14 (14.00)
21 - 30	18	18	36 (36.00)
31 - 40	18	9	27 (27.00)
41 - 50	7	3	10 (10.00)
51 - 60	3	4	7 (7.00)
61 and above	2	1	3 (3.00)
TOTAL	54	46	100 (100.00)

Table 2. Occurrence of otomycosis according to sex and laterality in 100 patients studied.

Sex	Right ear	Left ear	Both ears	Total (Number)
Male	30	18	6	54
Female	28	14	4	46
TOTAL	58	32	10	100

Table 3. Presenting symptoms in 100 cases of otomycosis from Benghazi.

Symptoms	Number of cases (%)
Itching	69 (69.00)
Pain	62 (62.00)
Feeling of some mass in the ear	52 (52.00)
Hearing impairment	34 (34.00)
Discharge	28 (28.00)
Tinnitus	1 (1.00)

Table 4. Fungi isolated from 95 cases of otomycosis.

Fungi (Percent)	Number isolated (Percent)
Candida species	62 (54.87)
Candida albicans	36 (31.87)
Candida tropicalis	18 (15.93)
Candida Krusei	6 (5.31)
Candida parapsilosis	1 (0.88)
Candida guilliermondii	1 (0.88)
Aspergillus species	40 (35.40)
Aspergillus niger	28 (24.78)
Aspergillus fumigatus	6 (5.31)
Aspergillus flavus	3 (2.65)
Aspergillus terreus	3 (2.65)
Penicillium species	2 (4.43)
Rhizopus species	3 (2.65)
Mucor species	3 (2.65)
TOTAL	113 (100.00)

Table 5. Single and mixed infections.

Infection	Number of cases (Percentage)
Single fungal infection	58 (61.05)
Mixed fungal infection	37 (38.95)
TOTAL	95 (100.00)

Table 6. Bacterial isolates and associated fungal isolates from mixed infections in 68 cases of otomycosis studied.

Bacterial isolates	With only Candida sps. infection	With only Aspergillus sps. infection	With mixed fungal infection	Total Number (%)
Gram positive				
Staphylococcus aureus	10	6	18	34 (29.32)
Staphylococcus epidermidis	6	4	4	14 (12.08)
Beta haemolytic streptococci	1	—	1	2 (1.72)
Streptococcus viridans	1	—	—	1 (0.86)
Streptococcus pneumoniae	1	—	—	1 (0.86)
Micrococci	3	4	6	13 (11.20)
Diphtherioids	3	3	4	10 (8.62)
Gram negative				
Pseudomonas aeruginosa	6	3	12	21 (18.10)
Proteus species	4	3	4	11 (9.48)
Esch. coli	2	1	2	5 (4.31)
Klebsiella species	2	1	1	4 (3.45)
TOTAL	39	25	52	116 (100.00)

Table 7. Various fungi isolated from 100 healthy controls used in this study.

Fungi	Male 50 (%)	Female 50 (%)	Total No. (%)
Candida species*	4 (8%)	2 (4%)	6 (6%)
Aspergillus species**	2	1	3 (3%)
Penicillium speices	1	—	1 (1%)
TOTAL	7	3	10 (10%)

* C. albicans 4,

C. tropicalis - 1,

C. krusei - 1

** All Asp. niger.

Table 8. The various bacteria isolated from 100 healthy controls.

Bacteria	Male	Female	Total
	50	50	Number (%)
Gram Positive			
Staphylococcus epidermidis	23	17	40 (43.96)
Staphylococcus aureus	11	8	19 (20.88)
Micrococci	6	2	8 (8.79)
Aerobic spore bearing bacilli	8	6	14 (15.38)
Diphtheroids	2	1	3 (3.30)
Gram negative			
Pseudomonas aeruginosa	2	1	3 (3.30)
Proteus species	1	1	2 (2.19)
Esch. coli	1	—	1 (1.10)
Klebsiella species	1	—	1 (1.10)
TOTAL	55	36	91 (100.00)

Table 9. Occurrence of various fungi in patients with Otomycosis in different parts of the world.

Place and Author	Year	Number of Patients	Ferquency of Occurrence					
			Candida species	C. albicans	Aspergillus species	A niger	Penicillium species	others
			Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)
(Present study) Benghazi, Libya (Rao et al)	1991	95	62 (54.87)	36 (31.87)	40 (35.40)	28 (24.78)	5 (4.43)	6 (6.32)
Bahrain, State of Bahrain (Paulose et al) (24)	1989	171	29 (16.96)	—	136 (79.53)	93 (54.39)	6 (3.5)	—
Visakhpatnam, India (Anwarullah et al) (2)	1987	100	4 (4.00)	4 (4.00)	91 (91.00)	58 (58.00)	3 (3.00)	2 (2.00)
London, U. K. (Mugliston et al) (21)	1985	1061	636 (59.94)	210 (19.79)	418 (39.4)	229 (21.58)	5 (0.47)	24 (2.26)
Boden, Sweden (Nielsen) (22)	1985	297	122 (41.07)	98 (33.00)	104 (35.01)	92 (31.00)	48 (16.16)	24 (8.08)
Catania, Italy (Oliveri) (23)	1984	80	13 (16.25)	9 (11.25)	66 (82.5)	54 (67.5)	—	6 (2.02)
Cairo, Egypt (Maher et al) (17)	1982	180	12 (6.38)	11 (5.85)	96 (51.06)	58 (30.85)	32 (17.02)	48 (26.67)
Rangoon, Burma (Than et al) (32)	1980	189	1 (1.00)	1 (1.00)	185 (97.88)	113 (59.78)	1 (1.00)	—

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A Study of *Pseudomonas Aeruginosa* Isolated from Hospital Infections in Benghazi

Amal Mohammad Bayou, P. A. Jayakar and Saleh Baiu

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الملخص

في هذه الورقة عرضنا نتائج البحث الذي أجريناه في أربع من مستشفيات الجماهيرية — بينغازي . لقد قمنا بعزل مئتي سلالة من سلالات جرثوم الزائفة الزنجارية ، ثم حددنا حساسياتها لعدد من الصادات وأنماط بيوسيناتها . فقد أظهرت هذه الدراسة أن لهذه السلالات حساسية قصوى لصادات الكوليستين بنسبة 95% ثم لصادات الجنتاماسين بنسبة 70.5% فصادات الكاربينسلين بنسبة 52.5% ، وقد لاحظنا أيضاً مقاومة عالية أو كاملة لهذه السلالات لبقية الصادات التي استخدمت في هذا البحث . كذلك تمكنا من تحديد أنماط 99.5% من هذه السلالات التي تم عزلها بواسطة التنميط البيوسيني .

SUMMARY

Two hundred strains of *Pseudomonas aeruginosa* isolated from four different hospitals in Benghazi, were tested for antibiogram and pyocin typing patterns. The sensitivity was highest to colistin (95%) followed by gentamicin (70.5%) and carbenicillin (52.5%). High or total resistance was observed to all other antibiotics, with all strains exhibiting multiple antibiotic resistance. Pyocin typability was very high (99.5%) but only 56.8% of them were classifiable with type A₁ as the predominant pyocin type (112 strains).

INTRODUCTION:

Pseudomonas aeruginosa is distributed world-wide and ubiquitous in nature. It is one of the most common organisms causing hospital infections ranging from local lesions like wound infections and bedsores to fatal septicaemia following burns and debilities.

Pseudomonas aeruginosa possesses a considerable degree of natural resistance to antibiotics and hence treatment is not only unsatisfactory in general, but highly problematic in some cases. Apart from constant vigilance and

strict aseptic precautions required to prevent *pseudomonas* cross infections in hospitals, constant epidemiological surveillance of the nature and type of the strains in the hospital is also essential. Several typing methods are available for epidemiological purposes which include bacteriophage, serological and pyocin typing. Of these, pyocin (*aeruginosa*) typing is simple and suitable for investigating hospital infections in the hospital laboratory, because it is easy to perform without need of maintaining bacteriophages or antisera.

In the present work the nature of *Pseudomonas aeruginosa* strains encountered in the hospitals of

Amal Mohammad Bayou, P. A. Jayakar
Department of Laboratory Medicine, Faculty of Medicine, Al-Arab Medical University, Benghazi .
Saleh Baiu, Department of Botany, Faculty of Science,
Garyounis University, Benghazi, Libya.

Benghazi, Libya is studied with special reference to their antibiotic sensitivity and pyocin typing patterns. There were no earlier data on pyocin typing of local strains.

MATERIAL AND METHODS:

Strains of *P. aeruginosa*: Two hundred strains of *P. aeruginosa* were included in this study. The strains collected were random isolates from different infections (Table 1) developed by patients admitted in four teaching hospitals of Benghazi during the period between January '88 to August '88.

All isolates were identified on the basis of their morphology, colony characters, growth at 42°C and biochemical characters which included oxidase test (Roche Basel, Switzerland), utilization of glucose (aerobically and anaerobically), lactose and maltose and arginine dehydrolase activity (oxi-ferm tube II, Roche, Basel Switzerland). Production of pigments, pyocyanin and fluorescein, was tested by inoculating into King, Ward and Ranney's media A and B, respectively (7).

Antibiotic susceptibility testing: The Bauer Kirby (2) single disk diffusion method was used to test the susceptibility of strains. Commercially available disks (Oxoid, Basingstoke, England) of gentamicin (10 ug), ampicillin (10 ug), cephaloridine (25 ug), tetracycline (30 ug), carbenicillin (100 ug), colistin sulphate (10 ug), chloramphenicol (10 ug) and septrin (25 ug) (Trimethoprim and Sulphamethoxazole) were used. For isolates from urine samples, U 4 multidisks (Oxoid, Basingstoke, England) were used, with nalidixic acid (30 ug) and nitrofurantoin (200 ug) included in addition.

Pyocin typing: All isolates of *P. aeruginosa* were subjected to pyocin typing at the "7th April" Hospital Laboratory in Benghazi according to the method of Darrell and Wahba (5) with slight modification (9) using the following 10 indicator strains, (supplied by Prof. Shrinivas of All India Institute of Medical Sciences (AIIMS), New Delhi, India).

Strain No. 1	M 8
Strain No. 2	B 10
Strain No. 3	S 17

Strain No. 4	B 26
Strain No. 5	B 39
Strain No. 6	A 52
Strain No. 7	8/39
Strain No. 8	10/55
Strain No. 9	AIIMS 785/76
Strain No. 10	AIIMS 790/76

A single colony of test organism was inoculated into glucose peptone water and incubated for 4 hours at 32°C. Tryptone glucose agar containing mitomycin-C (25 ug%) in glass Petri-dishes were streaked by a loopful of the four-hours growth of the test-strain as approximately 1 cm wide-band in the center of the plate. Plates were incubated for 18 hours at 32°C. The resulting growth was scraped off by using sterile slides. The residual growth was killed by exposure to chloroform vapour for 15 minutes. The plates were later exposed to air for 2 minutes.

One small loopful from each of four-hours old culture of 10 indicator strains was streaked in parallel lines at right angles to the site of the scraped test strain (five on either side).

Plates were then incubated at 32°C for 18 hours and examined under light. Among the 10 indicator strains, those which were inhibited (i.e. where there was no growth across and at least 5 mm away from the edge of test strain inoculation) were noted as positive. Those which grew across the site of test strain inoculation and not inhibited were noted as negative. If all 10 indicator strains grew across the site of test strain inoculation, such strains were noted as non-typable.

All typable strains were coded according to Al-Jumaili system (1), grouping the indicator strains into three triplets serially ; 1, 2, 3; 4, 5, 6 and 7, 8, 9. In each triplet, first, second and third indicator strains inhibited were given a value of 1, 2 and 4, respectively. The value of the indicator strains inhibited in each triplet was totalled and mnemonic code number given suffixing + or - depending on the inhibition or not of the last indicator strain (No. 10). Thus when all the indicator strains are inhibited the Mnemonic value will be 777 + corresponding to pyocin type A 1.

RESULTS:

The biochemical characters of the 200 strains of *P. aeruginosa* collected for this study are shown in table 2. The majority of these strains (71%) produced both pyocyanin and fluorescein (Table 3), while 17% produced fluorescein only and 6% Pyocyanin only, and in the remaining 6% neither pigment was produced.

Antibiotic sensitivity tests showed that 95% of the strains were sensitive to colistin, 70.5% were sensitive to gentamicin and 52.5% were sensitive to carbenicillin but highly resistant to the rest of antibiotics tested (see Table 4).

Results of Pyocine typing (table 6) showed that 199 isolates were typable by the method used in this study and only one strain was found non-typable. 113 (56.8%) typable strains were classifiable into standard types, out of which 112 strains belonged to type A₁, and one other belonged to type A₃.

Eighty six strains (43.2%) were non-classifiable but could be labelled into 27 types by the mnemonic coding system. Type 765+ was the most common among them, exhibited by 30 non-classifiable strains.

DISCUSSION:

P. aeruginosa has emerged as one of the most troublesome organism causing hospital infections in recent times (3). Most of the isolates in this study were from wounds and bedsores. Next in order were isolates from urinary tract infection (UTI) (Table 1). This indicates their frequency of infection in these areas in the hospitalized patients.

All isolates were oxidase positive, grew at 42°C, utilized glucose aerobically and dehydrolyzed arginine, but failed to utilize lactose, maltose and glucose anaerobically (table 2). Although production of pigments is a striking character of *P. aeruginosa*. 12 (6%) isolates did not produce either pyocyanin or fluorescein (Table 3).

The susceptibility pattern of the isolates (Table 4) revealed that colistin, gentamicin and carbenicillin are the most effective antibiotics with 95.0%, 70.5% and 52.5% of the isolates respectively being sensitive. The other antibiotics tested exhibited a high degree of resistance.

All the 200 isolates exhibited multiple antibiotic resistance. Although none of them showed total resistance to all the 8 antibiotics tested, as many as 199 (99.5%) exhibited resistance to 4 or more antibiotics tested. Multiple antibiotic resistance is well known in *Pseudomonas* strains isolated from hospitals, acquiring resistance from other gram negative bacilli (10). The present results indicate the need to control this trend of multiple resistance by using antibiotics cautiously and where absolutely necessary. Prophylactic use of antibiotics, often practised, should be discouraged unless supported by bacteriological investigation or the patient's condition absolutely demands it.

The typability of the isolates was very high with the method we used, with 99.5% being typable and only one (0.5%) non-typable. A certain proportion of non-typable strains were always encountered, the number varying according to the source of strains and method of typing used. Darrell and Wahba (5) recorded 7.6%, Duncan and Booth (6) 9.7%, Conray et al (4) 11.6% and Chowdhury (3) 10% of strains as non-typable. Shrinivas (8) reported 16.5% as non-typable.

However, among the typable isolates only 113 (56.8%) were classifiable according to conventional (Standard) types and the other 86 (43.2%) non-classifiable. Among the classifiable isolates, 112 belonged to type A₁. Type A₁ was reported to be the most common (6,9). In all these studies, there was one most common pyocin type but several strains belonged to other pyocin types also.

Regarding 86 isolates (43.2%) which were typable but non-classifiable according to conventional types, by adopting this coding system they could be labelled into 27 types with 765+ as most common pattern (30 strains).

These results, however, do indicated the need to use either an extended scheme of Pyocine typing.

Using more indicator strains method, or a combination of methods so that the predominant type may be subdivided into a number of identifiable types. That will be epidemiologically far more useful in the investigation of hospital infections caused by *Pseudomonas aeruginosa*.

Table 1. Results distribution of *P. aeruginosa* isolates.

Source	No. of isolates	Percent
Pus from wounds & bedsores	73	36.5
Urine	51	25.5
Ear discharge	37	18.5
Sputum, bronchial & throat secretions	23	11.5
Stool	10	5.0
Conjunctival discharge	3	1.5
Blood	1	0.5
C. S. F.	1	0.5
Bile	1	0.5
TOTAL	200	100.0

Table 2. Biochemical characters of 200 *Pseudomonas* isolated.

Test	Percent Positive	Percent Negative
Oxidase	100	—
Growth at 42°C	100	—
Aerobic glucose	100	—
Arginine dehydrolase	100	—
Anaerobic glucose	—	100
Lactose	—	100
Maltose	—	100

Table 3. Pigment production of *P. aeruginosa*.

Pigments Produced	No. producing	%
Pyocyanin & fluorescein	142	71
Pyocyanin only	12	6
Fluorescein only	34	17
None	12	6

Table 4. Antibiotic sensitivity of 200 isolates of *P. aeruginosa* from clinical specimens.

Antibiotic	Sensitive	Resistant
	No. (%)	No. (%)
Colistin	190 (95.0)	10 (5.0)
Gentamicin	141 (70.5)	59 (29.5)
Carbenicillin	105 (52.5)	95 (47.5)
Tetracycline	21 (10.5)	179 (89.5)
Chloramphenicol	3 (1.5)	197 (98.5)
Cephaloridine	1 (0.5)	199 (99.5)
Ampicillin	0 (0)	200 (100.0)
Seprin	0 (0)	200 (100.0)
Nitrofurantoin*	0 (0)	51 (100.0)
Nalidixic acid*	0 (0)	51 (100.0)

* Tested for urinary isolates only.

Table 6. Pyocine types of *P. aeruginosa*.

Mnemonic Code	Pyocine type	No. of isolated
777 +	A 1	112
773 +	A 3	1
765 +	Unclassified	30
775 +	Unclassified	13
665 +	Unclassified	5
164 +		5
675 +		3
701 -		2
176 -		2
564 +		2
767 +		2
713 -		2
774 +		2
174 +		2
154 -		2
743 -		1
024 +		1
177 +		1
635 -		1
633 -		1
042 -		1
764 +		1
501 -		1
733 -		1
723 -		1
624 +		1
621 -		1
377 +		1
166 +		1
Non-typable		1
TOTAL		200

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The Experience of Al-Jamahiriya Hospital Benghazi , with Breech Presentation

Jaffer J., Khanna S. and Legnain M. M.

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الملخص

ينحى الأطباء في جميع أرجاء العالم إلى إجراء عمليات قيصرية في حالات مجيء الوليد بالمقعد ، إلا أن ذلك قد لا يوافق المجتمعات التي لا ترحب بصغر العائلات والحد من عدد الولادات . أجريت هذه الدراسة في مستشفى الجماهيرية للولادة في بنغازي عن الولادات التي حدث فيها مجيء الوليد بالمقعد من بين حوالي (18,000) ولادة سنوياً . كان متوسط الوزن الولادي (4000) غ حجم للوليد ومتوسط رقم الولادة من 6 : 7 . كانت نسبة حدوث المجيء بالمقعد 3,26% ، معظمها (76%) ولادة مهبلية ، و (24%) ولادة بالقيصرية . وكانت نسبة الوفاة « حوالي الولادة » عامة تعادل (26,8%) والنسبة المصححة 5,9% بالمقارنة بمتوسط نسبة الوفاة « حوالي الولادة » في مستشفى الجماهيرية والتي تبلغ 2,5% . وتشير هذه النتائج إلى أن هناك مبررات لعدم تسهيل دواعي إجراء العمليات القيصرية في حالات مجيء الوليد بالمقعد ، وأن فرز الحالات التي يمكن أن تولد عن طريق المهبل في أمان يظل هو الأساس في معالجة هذه الحالات وخاصة في المجتمعات التي بها أرقام ولادية عالية ولا توافق على الربط البوقي عندما تتكرر معها الولادات القيصرية ..

SUMMARY

Management of breech presentation has been a dilemma. Reports from all over the world show that there is an increasing trend of caesarean section for breech presentation, but this trend may not be applicable in parts of the world where a small family norm is not accepted. A study on breech presentation was done at Al-Jamahiriya Hospital, Benghazi, Libya which has a delivery rate of 18,000 per year. The average birth weight of baby is 4000 gram, and the average parity is 6 - 7. Incidence of breech was found to be 3.26%. Most of the cases (76.04%) had vaginal delivery, and caesarean section rate was 23.96%. Over all perinatal mortality was 26.83% and corrected perinatal mortality was 5.90% in comparison to average perinatal mortality figures of 2.5% in Al-Jamahiriya Hospital. Foetal morbidity was very low.

The study brings about a clear justification for not liberalising indication for caesarean section in breech and careful selection of cases who can undergo safe vaginal delivery remains the key management of these cases, specially in population where average parity is high and consent for tubal ligation is not so easily accepted in cases of previous repeated caesarean sections.

Jaffer, J., Khanna S. and Legnain, M. M.;
Department of Obstetrics & Gynaecology, Al-Arab Medical University, Benghazi, Libya.

INTRODUCTION:

There has been an abrupt change in the management of breech presentation. Choice of delivery has become caesarean section, to avoid even a minimal perinatal mortality and morbidity. But in most Arab countries, including Libya, where a woman starts her obstetric career at an early age, grand multiparity is still socially prevalent and the practice of caesarean section for almost all viable breech presentation cannot be universally accepted. Proper management of women with breech presentation today entails the careful selection of those patients who can undergo safe vaginal deliveries.

With this background it was decided to analyse the breech deliveries taking place at Al-Jamahiriya Hospital, Benghazi which is the only maternity hospital providing obstetric care to the city of Benghazi and nearby places. Main objective of this study was to find out the incidence of breech presentation, to study the mode of delivery of breech presentation in this population in view of changing trends, and its effect on maternal and foetal morbidity and mortality.

MATERIAL AND METHODS:

All cases of Singleton breech presentation of more than 28 weeks gestational age, admitted to obstetric unit from July 1985 to December 1985 were taken into this study. Cases of multiple pregnancy with 1st or 2nd baby presenting as breech were not included. A detailed history, medical and obstetrical examination was done to determine gestation size, type of breech, condition of cervix, station of breech and pelvic size. Besides routine investigations, ultrasound scanning was done. A decision was taken early in labour and a policy of minimal interference was followed with episiotomy and assisted breech

delivery in most of the cases. An experienced neonatologist and anaesthetist always attended the women delivering as breech presentation.

RESULTS:

The incidence of breech presentation was found to be 3.26% (See Table I). Out of total 288 cases, 68.75% were in the age group 30 - 35 years, 4.86% below 20 years, and 26.39% above the age of 35 years. A study of parity in relation to breech revealed 12.5% to be primigravida, 26.38% to be between second and fourth para, and 61.12% to be grandmultiparas, including 12.16% of the grandmultipara patients being between eleventh and fifteenth gravidas.

Of all the breech cases admitted during labour only 41.60% were found to be booked cases.

Twenty nine cases (10.06%) of all breech presentation were premature by date, as calculated from last menstrual period and confirmed by ultrasound scanning.

TABLE I. Incidence of Breech Delivery at Al-Jamahiriya hospital from July 1985 to December 1985.

Total No. of Deliveries	Total No. of Breech	Percentage
8833	288	3.26

Table II shows that frank breech was more commonly encountered in primigravidas (61.11%) and complete breech in multigravidas (45.63%). Footling presentation was also more common in multigravidas.

TABLE II: Showing Type of Breech.

TYPE	Primigravida	Multipara	Total
	No. (%)	No. (%)	No. (%)
Complete	8 (22.22)	115 (45.63)	123 (42.71)
Incomplete	—	—	—
Frank	22 (61.11)	85 (33.73)	107 (37.15)
Footling	4 (11.12)	45 (17.86)	49 (17.01)
Unknown	2 (5.55)	7 (2.78)	9 (3.13)
	36 (100)	252 (100)	288 (100)

Table III shows that definite associated factors were evident in only 29 cases (10.06%) which were due to prematurity. The other common causes were fetopelvic disproportion and congenital anomalies. Out of 212 cases where the cause could not be pinpointed, 30% showed cornu fundal insertion of placenta on ultrasound scanning.

TABLE III: Showing Probable Associated Factors.

Aetiological Factors	No. of Cases (%)
Feto-Pelvic Disproportion	20 (6.96)
Prematurity	29 (10.06)
Congenital Anomalies	18 (6.25)
Hydramnios	5 (1.74)
Placenta Previa	4 (1.39)
Unknown	212 (73.60)
TOTAL	288 100%

Table IV shows that the caesarian section rate was 23.96% in the present series. Most cases (69.09%) were delivered by assisted breech delivery. Out of 69 cases undergoing caesarean section, 34 had more than one indication for caesarean section (see Table V). 9 cases underwent elective caesarean section. The most common indication was failure of breech progress (30.43%), fetopelvic disproportion (27.54%) and previous caesarean section (26.09%). 18.84% (1) were primigravida

with breech presentation, who underwent caesarean delivery. This was due to method of management of one unit of hospital who preferred caesarean section for all primigravida with breech, but the fact that 4/5th delivered normally, states that first pregnancy alone should not be an indication for caesarean section unless associated with another complication.

TABLE IV: Showing Type of Breech Delivery.

Type of Delivery	No. of Cases	Percentage
Spontaneous Breech	16	5.56
Assisted Breech	199	69.09
Breech Extraction	4	1.39
Caesarean Section	69	23.96%

TABLE V: Indication for Caesarean Section in 69 Breech cases.

	No. (%)
Hypertensive Disorder or Pregnancy	6 (8.69)
Prolonged premature rupture of membrane	7 (10.14)
Cord Prolapse	3 (4.34)
Fetopelvic disproportion	19 (27.54)
Previous caesarean section	18 (26.09)

Bad obstetric history	4 (5.80)
Diabetes mellitus	2 (2.90)
Failure to progress	21 (30.43)
Foetal distress	3 (4.34)
Accidental haemorrhage	2 (2.90)
Placenta previa	4 (5.80)
Previous myomectomy	1 (1.45)
Primigravida	13 (18.84)
Total	103*

* This total of 103 in Table does not tally with 69 cases who actually had caesarean section since indication was more than one in some cases.

Table VI shows that the most common complication was prolonged labour and premature rupture of membranes. Difficulty during delivery was encountered at the level of head in 19 cases. This may be because all low birth babies were delivered vaginally. Out of two cases who had rupture uterus, one had uterine injury during exploration for adherent placenta, and another had difficulty in delivery of head which resulted in big cervical tear extending to lower uterine segment.

TABLE VI: Showing complication and difficulties during labour in breech cases.

Complications & Difficulties	No. (%)
Cord Prolapse	8 (2.78)
Premature rupture of membrane	48 (16.67)
Prolonged labour	62 (21.52)
Difficulty at the level of breech	3 (1.04)
Difficulty at shoulder	15 (5.20)
Difficulty in after coming head	19 (6.58)
Post partum haemorrhage	12 (4.16)
Retained placenta	5 (1.7)
Rupture uterus	2 (0.69)
Total cases 288	174 (60.41)

Table VII shows that severe asphyxia occurred more in babies delivered by vaginal route. But even

in babies born by caesarean section moderate asphyxia was shown in greater percentage of cases since prolonged labour and failure to progress were common indications of caesarean in Breech. This fact emphasises timely caesarean section in carefully selected breech cases instead of doing it late in labour.

Asphyxia was the most common complication in babies delivered by breech. Eight cases (2.78%) developed intracranial haemorrhage and 6 out of them were premature who had difficulty in delivery because of aftercoming head.

TABLE VII: Showing Foetal Assessment by Apgar Score.

Apgar at 1 minute	Vaginal Delivery	C. S. Delivery
	No. of cases (%)	No. of cases (%)
1 - 3	16 (7.31)	4 (5.80)
4 - 7	162 (73.97)	56 (81.16)
8 - 10	30 (13.70)	6 (8.70)
0	5 (5.02)	1 (4.35)
Intrauterine death	6 (2.73)	2 (2.90)
TOTAL	219	69

Thirty five cases, had birth weight less than 2500 gm with 17.14% of them, small for date. The mortality rate was 100% in breech babies born with birth weight less than 2000 gms. Mortality percentage dropped with increasing foetal weight. But again there was trend towards increasing perinatal death above 4000 gms (see table VIII). Out of 42 babies having birth weight more than 4000 gms, 28 were between 4000 to 4500, 11 between 4501 and 5000 gms and 3 more than 5000 gms.

TABLE VIII: Showing Foetal Weight in Breech Cases & Perinatal death in relation to Foetal Weight.

Foetal Wt. (gms)	No. of Cases (%)	No. of deaths (%)
1000 - 1500	11 (3.82)	11 (100)

1501 - 2000	8 (2.76)	8 (100)
2001- 2500	16 (5.56)	7 (43.75)
2501 - 3000	49 (17.01)	9 (20.40)
3001 - 3500	84 (29.14)	3 (3.84)
3501 - 4000	78 (27.06)	4 (4.68)
4001 & above	42 (14.58)	17 (40.04)
TOTAL	288 (100)	59 (295)

Overall perinatal mortality in this series of breech cases was 20.50%. But after excluding causes not directly related to breech such as congenital abnormality, diabetes, accidental haemorrhage, the corrected mortality was 5.9%.

DISCUSSION:

The incidence of Breech was found to be 3.25% in Al-Jamahiriyah Hospital which is similar to that reported from other parts of the world, 3.3% (2). Age of the patient did not show any significant relation to incidence of Breech. Of women in the study group, 12.5% were Primigravida and 61.72% grandmultipara. A higher incidence in primigravida has been reported, 59% by Grave (3) and 43% by Mann & Gallant (4).

Low birth weight as an association of breech was found in 14.58%. Incidence of prematurity in breech has been reported by various workers to be from 12% to 30% (5). Morgan (6) documented higher incidence of breech, 18 to 20% in premature.

Common associated factors found in breech pregnancy which will reach term are abnormality of uterine shape, congenital malformation of foetus, hydramnios and fetopelvic disproportion contributed to breech presentation. Congenital malformation of foetus has been reported as 3.6 - 6.3% in breech compared to 2.5% in cephalic by Brenner (2). The figures 6.25% in present study, also agrees with the reported data. Opinion is divided over the extent to which breech presentation could be caused by contracted pelvis. Beisher, 1966 could demonstrate contracted pelvis in only 3% of his cases (7). In the present series only 1.74% cases out of 6.96% cases of Foetopelvic disproportion were found to be associated with contracted pelvis,

the rest were due to fetopelvic disproportion due to big babies. Average birth weight in Libyan population is around 4000 gms. It was an interesting observation to get cornu fundal insertion of placenta in 30% cases on ultrasound scanning out of 199 cases where no cause could be attributed clinically. Fianu and Vaclavinkova found cornu fundal insertion of placenta which interferes with uterine shape in 72.6% of a series of 124 full term breech in comparison to 4.8% of controls by U. S. S. (8).

Among type of breeches, frank breech was more common in primigravida and footling presentation was more common in multigravida. Dewhurst also documented the same (9).

Results of present study show that assisted breech delivery in properly selected cases is the best method of delivery. In the present series 69.09% cases were delivered by assisted breech. Berger as early as 1927 commented that interference prior to delivery of the trunk, whether elective or indicated, increases the risk involved with delivery of the head (10).

Caesarean delivery was done in 23.9% cases of 288 breeches. By mid 1970's, many institutions reported caesarean section rate for breech presentation in excess of 50% (11). This trend towards caesarean sections has been due to recognition that X-ray pelvimetry, external cephalic version, or application of forceps could not totally avoid the birth injury, umbilical cord prolapse, and birth anoxia associated with vaginal breech delivery. In breech, perinatal mortality has been reported as zero by caesarean section for uncomplicated primigravida as well as multigravida (12). However, maternal morbidity associated with caesarean section as well the prevalence of grandmultiparity in Libyan population precludes a total commitment to caesarean section in breech delivery.

A study of Apgar score assessment at one minute indicated that, though severe asphyxia was more common with vaginal delivery, but caesarean does not preclude the foetus from asphyxia completely, moderate asphyxia was shown by 81.16% of babies born by caesarean section in comparison to vaginal delivery. This could have been due to caesarean delivery performed in 30.43% in late stages due to failure of progress which might have been associated

with prolonged labour also. Taking into account the foetal morbidity, asphyxia was the major cause in 12.50% cases and intracranial haemorrhage was seen in 8 cases out of which 6 were premature.

Low birth weight associated with breech presentation contribute significantly to breech perinatal mortality. In the present study 100% babies with birth weight less than 2000 gms died and 43.75% of foetal weight 2000 - 2500 grams also died. Though Colles and Weghorst have shown that no neonatal deaths occurred in foetus weighting more than 1840 grams regardless of route of delivery (13). Ingemanson showed that delivery of preterm breech by caesarean section significantly reduced prolonged severe asphyxia and neonatal mortality from 14.6% to 4.8% (14). They advocated routine use of caesarean section for preterm breech. In present series, since all low birth babies were delivered vaginally; therefore the extent to which caesarean section would have been useful regarding survival of those infants cannot be estimated, and it is well accepted that the neonatal mortality of preterm breech also depends on facilities of neonatal care in obstetric department. Perinatal mortality also showed increasing trend with increase in foetal weight above 4000 gms. Therefore assessment of foetal weight is an important criteria in management of breech.

Overall perinatal mortality in the present series was found to be 20.50% and corrected perinatal mortality is 5.9%. Morgan & Kane reported it to be 32% as gross perinatal mortality.

This study indicates that, careful selection of those patients whom the obstetrician believes can undergo safe vaginal delivery is the proper management, specially in population where average parity is high to reduce the incidence of caesarean section. Parity should not influence the mode of delivery since inspite of proven pelvic adequacy a multigravida may face problem of foetopelvic disproportion. Foetal weight should be carefully assessed and related to gestation size to determine the mode of delivery. Whether delivered vaginally or by caesarean section, foetus demands extreme

care during deliveries to avoid asphyxia.

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Insulin Resistance in Diabetic Ketoacidosis

S. Gerryo, S. A. Razik and M. Ahmed

(Received september 22, 1991)

الملخص

تقرير عن حالة حمض كيتوني من مريض بالسكري مصحوباً بمقاومة عالية لعقار الأنسولين .. اجتماع هذه الحالات في حالة واحدة نادر الحدوث ويشير المؤلفون إلى كيفية علاج هذه الحالة ويلخصون المعلومات العالمية المنشورة عن مثلها .

SUMMARY

Diabetic ketoacidosis (D.K.A.) with marked insulin resistance is a rare event. We report a patient who presented with D.K.A. and required a large dose of insulin to control the metabolic decompensation. We also discuss briefly the literature on this metabolic problem.

INTRODUCTION:

Although insulin resistance is a constant feature of diabetic ketoacidosis (D. K. A.) it is rare to encounter a patient who requires very high doses of insulin during therapy (2,3). The following report concerns a patient with D. K. A. who exhibited marked insulin resistance.

Case History:

A 36 years old Egyptian female was hospitalized with the symptoms of polydipsia, polyuria, vomiting and breathlessness of few hours duration. She had diabetes mellitus for over five years which was initially treated with glibenclamide and metformin. However, one month prior to admission she required a daily single dose of Lente insulin of 30 units.

Examination at admission revealed an obese patient (B. M. I. 44.91 kg/m²) who was obtunded and dehydrated. The pulse rate was 120/min and regular, blood pressure 170/80 mHg, respiratory rate 48/min and oral temp. 37.1°C The laboratory data obtained at the time of admission included a

plasma glucose 624 mg/dl, plasma ketostix at dilution of 1:8, plasma sodium 132 mEq/L, potassium 5.3 mEq/L and blood urea nitrogen of 43 mg/dl. Treatment was initiated with rehydration and intramuscular injections of regular insulin of 20 units in the first hour, and 12 units hourly, along with potassium supplement and 100 mmol of sodium bicarbonate. Five hours later, due to inadequate response (plasma glucose was still at 524 mg/dl), the insulin therapy was changed to continuous intravenous infusion at a rate of 20 units hourly. The rate was doubled every two hours till she receive 160 units of regular insulin per hour. Sodium bicarbonate 100 mmol was given on two occasions. It took 19 hours and 1360 units of regular insulin to bring the D. K. A. under control (plasma glucose 223 mg/dl, plasma pH 7.43 and plasma ketostix negative).

Five hours after the start of intravenous insulin infusion she developed hypotension and itchy erythematous rash all over the body which responded to intramuscular adrenaline (0.5 ml of 0.1% and intravenous hydrocortisone, 400 mg).

S: Gerryo, S. A. Razik and M. Ahmed,

Department of Medicine, Faculty of Medicine, Al Arab Medical University, Benghazi, G. S. P. L. A. J.

DISCUSSION:

The majority of patients with D. K. A. respond to low dose insulin regimen (4). Insulin resistance in D. K. A. maybe caused by defect in intracellular metabolism (post receptor resistance) or, rarely, from prereceptor receptor resistance which can be only overcome by achieving a high concentration of insulin in plasma (7). The present patient presumably belonged to the second category.

Theoretically there are six factors (1,6) which could be operating in the pre-receptor receptor type of insulin resistance, namely acidaemic insulin antibodies, hypothermia, infection, high concentration of counter regulatory hormones, and lipid metabolites. The present patient had no clinical evidence of infection and had normal body temperature. The severe metabolic acidosis alone cannot account for the massive doses of insulin she needed. Moreover it has been found that the rate of fall of blood glucose in D. K. A. is not correlated with plasma pH despite the use of constant dose of insulin (5). The insulin resistance in our patient was evident even before she received adrenaline and hydrocortisone for the allergic reaction which developed. We believe that the large dose of insulin required to control D. K. A. in the present patient resulted from a high level of circulating insulin antibodies which, on rare occasions, can lead to severe insulin resistance (8).

Although insulin-binding antibodies could not be measured in the present patient because of lack of facilities, antecedent treatment with lente insulin

and the development of allergic reaction during the treatment of D. K. A. provide indirect evidence for the presence of circulating insulin antibodies with different subclasses.

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P.S.: The editor apologises to the authors of the above paper for improper printing in the previous issue of the Journal.

Nonpassage of Swallowed Foreign Bodies due to Congenital Gastroduodenal Junctional Diaphragm (A Case Report)

D. B. Gahukamble and Abdul Salam Khamage

(Received December 22, 1991)

الملخص

تقرير عن حالة غير عادية لثنشوه خلقي في الحجاب الحاجز حيث توجد فتحة مركزية عند منطقة اتصال المعدة بالإثنى عشر ، مما تسبب في انسداد نتيجة بلع أجسام غريبة . زالت الأعراض تماماً عند استئصال الحجاب الحاجز ورأب الإثنى عشر جراحياً .

SUMMARY

This is a report of an unusual case of a congenital diaphragm with a central aperture situated in the region of gastroduodenal junction. Small swallowed foreign bodies failed to negotiate it and caused obstruction. Excision of the diaphragm and pyloroplasty relieved the symptoms completely.

INTRODUCTION:

During infancy, unintentional swallowing of foreign bodies is common and are very often unnoticed by parents as these are passed via naturalis. Only when these swallowed objects are retained in the stomach and give rise to symptoms, the patient is brought to a clinician. In such a situation, gastric outlet obstruction is suspected and further investigations are done. This was the case in a year and a half old infant in whom nonpassage of otherwise passable foreign bodies in the stomach led to the diagnosis of gastric outlet obstruction.

Case report:

A previously healthy 1 1/2 year old, 9 kg male infant was admitted in the Children's Surgical Ward of "Al Jala" Hospital, Benghazi, with a history of nonbilious vomiting since the age of 7 months. The vomiting was projectile and occurred 3 - 4 hours after feeds.

The patient was the 4th boy in the family. The parents were blood related of first degree consanguinity. The medical history of earlier siblings was as follows: The first baby was born at home and died five days after birth, from an unknown cause. The second baby was a male who died immediately after birth. The third male baby expired at the age of 40 days following episodes of excessive vomiting.

On clinical examination, the infant was pale and dehydrated. There was epigastric fullness and visible gastric peristalsis. No definite mass could be felt. Except for the presence of anaemia with Hb of 9.5 gm%, all other haematological and biochemical studies were normal. Plain X-ray of the abdomen revealed multiple radiopaque shadows in the epigastric region which changed position in the lateral views. On abdominal ultrasound examination, these foreign bodies moved in the stomach to and fro from fundus to pylorus. Barium

D. B. Gahukamble and Abdul Salam Khamage,
Department of Surgery (Paediatric), Faculty of Medicine, Al-Arab Medical University, Benghazi, GSPLAJ.

meal showed subacute obstruction at the pyloro-duodenal junction (Fig. 1). The stomach was dilated and barium was retained for more than 24 hours.

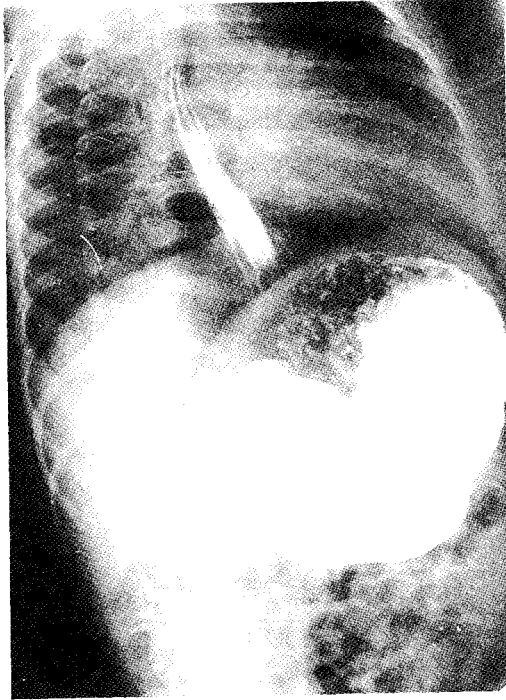


Fig. 1: Barium studies showing the hugely dilated stomach.

At surgery, the external appearance of the pyloroduodenal area were normal. Gastrotomy was performed and attempts to negotiate a rubber catheter through the pylorus failed. The gastrotomy was enlarged and direct visualization showed a thick diaphragm with a tiny central aperture. It was excised and Henelicke-Miculicz pyloroplasty was performed. Post-operative course was smooth and the patient's recovery was complete. Follow up barium studies showed a patent and adequate pyloric canal. A year after the surgery the child appeared normal for his age and was symptom-free.

Histopathologic studies showed the septum lined proximally by gastric mucosa and distally by duodenal mucosa with a central core of loose areolar tissue.

Disussion:

In the present patient, inspite of the narrowed gastric outlet, no appreciable symptoms were present in the earlier period of infancy. This could be because the patient was on liquid feeds which easily passed through the aperture. However, when later, feeds contained solids the passage of gastric contents became difficult leading to vomitng of gastric contents.

In the family of this patient 3 other siblings died during the neonatal period. It is possible that they had some kind of congenital malformation and it is also probable that they might have had similar condition like that of the present patient. If such an assumption is made, a familial occurrence of this anomaly must be suspected. However, no familial incidence of congenital incomplete duodenal diaphragm has been reported in the literature.

Plain x-ray of the abdomen and ultrasonographic findings confirmed the presence of multiple swallowed foreign bodies. Further studies with barium meal confirmed the presence of subacute gastric outlet obstruction. Since the clinical as well as radiological features were not suggestive of more common lesions such as congenital hypertrophic pyloric stenosis, the possibility of the presence of a diaphragm was considered. Although it is difficult to demonstrate the presence of a diaphragm with central aperture by radiologic studies, in this patient, retention of barium in the dilated stomach and non-passage of smaller foreign bodies supported the clinical suspicion of congenital diaphragm. Small foreing bodies are frequently swallowed by infants and these are passed distally with ease. Therefore, nonpassage of otherwise passable foreign bodies in the stomach should raise the suspicion of the presence of congenital pyloric diaphragm with a central pinhole, although, if the aperture in the diaphragm is wider than one cm., obstructive symptoms do not occur (3).

Histopathologically, antral diaphragm is a septum lined by mucosa on either side with a central core of loose areolar tissue. In the earlier extensive reviews on this subject, Gerber (2) and later Berr et al (1), confirmed that it was unusual to find a

well formed muscular layer in the central core of the antral diaphragm. In our patient, the findings were similar but the presence of gastric mucosa on one side and duodenal type of mucosa on the distal side places the site of the diaphragm at the anatomical junction of antrum and duodenum.

Incomplete gastrointestinal diaphragm is a rare condition. Its exact pathogenesis is not known. However, it is presumed that the mucosal diaphragm was the result of incomplete canalization of the foregut analage during the 5th or 6th week of embryonic period (4). In this patient, uniformity of the histological apperance, lack of fibrosis and inflammation favours the origin as being congenital. Complete excision of the diaphragm with pyloroplasty gives good results as shown in this patient. In older patient, endoscopic resection has

been attempted (1) but such procedure has not been carried out in paediatric age group.

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Dermato-Fibrosarcoma Protuberans of the Vulva (A Case Report)

Shail Khanna, M. M. Legnain

(Recieved April 24, 1991)

الملخص

انتفاخ عقيدي في فرج امرأة عمرها 32 سنة ، عاد للظهور بعد عام من استئصاله .
الفحص النسيجي المرضي أظهر أنه غرن ليفي جلدي وهو نادر الحدوث في الفرج وينتشر
موضعياً .

SUMMARY

A woman aged 32 years had a nodular vulval swelling of 5 × 3 cms. which recurred one year after excision. Histological diagnosis showed features of Dermato-fibrosarcoma protuberans. Few cases of this tumor, which is locally invasive, have been described on vulva.

INTRODUCTION:

Dermato-fibrosarcoma protuberans presents a slow growing tumor originating in the Dermis with a marked tendency to recur. The lesion was initially described by Darier; 1924 (1) and the term Dermato-fibrosarcoma protuberans was coined by Hoffmann; 1925 (2).

It is a tumour observed in both males and females. The frequent sites are the trunk and extremities, particularly the flexures. But scalp, face and neck are also affected. Very few cases have been reported from the vulva (5, 6).

The tumour begins as an indurated plaque in which subsequently multiple purple firm nodules arise. They are asymptomatic to start with but few become painful. Despite this locally invasive behaviour, fatal metastasis have been reported to regional lymph nodes of distant sites, like lungs and brain. (Wooldridge; 1957) (3).

Histological appearance of tumour is that of a fairly well differentiated fibrosarcoma. Penetration

of tumour into subcutaneous fat is common and in rare instances the tumour cells even infiltrate the fascia and underlying muscles.

Electron microscopy suggests a neural origin of the tumour (4), though other studies are in favour of histiocytic origin (5).

CASE REPORT:

N. H., 32 year old woman, Para three, was admitted on 25.11.87 with complaints of asymptomatic swelling of vulva for 10 years. Her menstrual history was normal. She had three full term normal deliveries, the last delivery occurring four years ago. She was diabetic for two years. Examination revealed normal vital signs and nothing abnormal was found on general examination. Local examination of external genitalia revealed a multinodular swelling on right labia majora. There were three small firm nodules of 3 × 3 cm., 3 × 2 cm and 2 × 1 cm size with indurated margins. There was no regional

Shail Khanna and M. M. Legnain,
Department of Obstetrics & Gynaecology, Al-Arab Medical University, Benghazi, Libya.

lymphadenopathy. Vagina, cervix, uterus and adnexa were normal.

A diagnosis of fibroma of vulva was made. Excision of the swelling was done by elliptical incision around the swelling. Patient was discharged after seven days with an advice to come for regular follow up. Histopathology revealed a diagnosis of Dermato-Fibro-sarcoma protuberans with focal myxoid changes (Fig. 1).

to find any reports in the literature available to us. Dermato-fibro-sarcoma protuberans of vulva adds another possibility in differential diagnosis of vulval tumour. Wide local excision is considered a satisfactory treatment. There is no evidence that radical treatment or other ancilliary modalaties have a place in the management of this condition. Incidence of recurrence falls significantly by early treatment and wide excision (6).



Fig. 1: Showing Dermato fibro-sarcoma of vulva.

Patient was readmitted on 1.2.89, after 14 months, with a 1 × 1 cm. nodule at the lower end of previous incision. A wide excision of swelling and including previous was done. The nodule was adherent to subcutaneous tissue only. Biopsy of the nodule revealed recurrence of Dermato-fibro-sarcoma Protuberans. This patient has been coming for regular follow up for one year since, and did not show any recurrence.

DISCUSSION:

This condition is very rare (6), and we were unable

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Recurrent Ectopic Pregnancy (A Case Report)

Shail Khanna, M. M. Legnain

(Received April 15, 1991)

الملخص

امرأة في الخامسة والعشرين من عمرها كانت قد أجريت لها عملية جراحية تلو حمل في البوق الأيمن ، ووجد أنها قد حملت في الجزء القصي من نفس البوق للمرة الثانية . عولجت جراحياً . وتناقش المقالة أسباب هذا النوع من الحمل وطريقة علاجه .

SUMMARY

A 25 years old woman, Para two admitted with previous history of surgery on right tube for ectopic pregnancy, was found to have recurrent ectopic in the distal segment of that tube. She was treated by right salpingectomy. Aetiology and management is discussed.

INTRODUCTION:

A patient with one ectopic pregnancy has a less favourable reproductive outlook. Grant (1) found that following an ectopic pregnancy only 12% of patients become pregnant and that of these not more than half gave birth to a live infant. Of the remaining pregnancies 25 per cent were ectopic and an additional 25% resulted in an abortion. Hemley (2) reported conception rates approaching 50% but with a comparatively high rate of ectopic gestations, and other reproductive abnormality.

This paper reports an interesting case of recurrent ectopic pregnancy on the same side.

CASE REPORT:

F. S., a 25 year old woman was admitted on 18.2.1990, with history of amenorrhoea of 50 days, bleeding per vaginum for one day, lower abdominal pain and dizziness for one hour. Her menstrual cycles were regular; the last menstrual period was on 7.1.90. She was Para 2. Three years

previously she had an operation for an ectopic pregnancy. Surgical notes on her last discharge ticket confirmed that she had a right partial salpingectomy for a ruptured tubal gestation on the right side. Her last delivery was seven years ago.

Examination revealed her general condition to be stable except for mild pallor. Her pulse rate was 94/minute, B. P. 120/70 mm Hg and temperature 37.2°C. There was a subumbilical midline scar. On abdominal examination there was tenderness, particularly in the right iliac fossa. There was no guarding or palpable mass. Pelvic examination revealed a normal size, anteverted uterus with a vague mass in the right fornix which was tender. The size could not be assessed. Cervical excitation was strongly positive. Pregnancy test was negative. Hb% was 11 gms%. Ultrasound examination showed a normal size uterus with empty cavity. On the right side there was a small gestational sac-like echo, within an adnexal mass measuring 3.5 × 3 cm. Some fluid was present in Pouch of Douglas.

*Shail Khanna and M. M. Legnain,
Department of Obstetrics and Gynaecology, Faculty of Medicine, Al-Arab Medical University, Benghazi, Libya.*

A provisional diagnosis of ectopic pregnancy was made. An immediate laparotomy was carried out which revealed blood in peritoneal cavity, and an uterus of normal size with omental adhesions. The right tube, the site of previous partial salpingectomy, was the site of an ectopic pregnancy. The products of conception were seen aborting from the fimbrial end. The right ovary was normal. The left ovary was not seen and left tube was kinked and surrounded by dense adhesions. A right sided salpingectomy was done and the abdomen closed after peritoneal toilet. Histology of the resected tube confirmed the diagnosis .

DISCUSSION:

Ectopic pregnancy may follow tubal ligation and even hysterectomy (3, 4). Such events provide evidence that the human egg will develop even in a very unfavourable environment outside the uterine cavity. Ligation of the Fallopian tube proximal to the migrating ovum has been seen to cause tubal gestation. Metz and Mastroianni (5) reported a few cases of ectopic implantation in the distal side of the constriction following tubal ligation for sterilization. Presumably, the mechanism involves the presence of microscopic lumina or fistulae that permit the escape of the spermatozoa but prevent the migration of the fertilised ovum into the uterine cavity.

Incidence of recurrent ectopic pregnancy (8%) has increased following conservative treatment by laparoscopy for ectopic pregnancy. A rate of 27%, was reported by Donnez and Niselle (6) in 300 patients with a history of microtubal surgery. Oelsner (7) reported the results of 442 patients operated upon conservatively for ectopic pregnancy and 1630 patients who had radical surgery. The recurrence rate of an ectopic pregnancy was 14.5

in the former and 11.5% in the later. The difference was not significant. In view of these results, the trend towards conservative surgery seems justified.

A more perplexing situation may arise if the only tube left (with or without previous ectopic pregnancy) is the site of ectopic, the incidence of which varies between 15 to 38% (7). It is suggested that resection and end to end anastomosis, or linear salpingostomy without closure, is preferable to salpingostomy with closure. A patient having solitary tube and ectopic pregnancy with a previous ectopic or tuboplasty should have salpingectomy since pregnancy outcome is very poor and recurrence rate much higher.

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Retroperitoneal Teratomas in Infancy (Report of Two Cases)

D. B. Gahukamble and Abdul Salam Khamage

(Received January 5, 1992)

الملخص

تقرير عن حالتين مصابتين بأورام مسخية خلف الصفاق ، يرد وصفهما ومناقشتها فيه .

SUMMARY

Two infants with large retroperitoneal teratomas are described and a brief review of the literature is given.

INTRODUCTION:

The term teratoma means 'monster' in Greek. It has been defined as a 'true tumour composed of multiple tissues of kinds foreign to the part in which it arises' (9). These tumours behave differently depending upon the anatomical location. They are found in all ages and in different sites. In children they occur in order of frequency, in sacrococcygeal regions, gonads, mediastinum, and retroperitoneum, and in rare sites. Teratomas account for about 5% of childhood tumours and 5% of teratomas occur in the retroperitoneal space (7). Retroperitoneal teratomas cause diagnostic pathologic and therapeutic problems. The present paper reports two cases in infants, in whom large retroperitoneal teratomas were successfully removed and highlights some of the salient features.

Case 1:

A 9 months old female infant was admitted in the Children's Surgical Ward of "Al Jala" Hospital, Benghazi, with abdominal distension which was noticed by the mother. There were no gastrointestinal or urinary symptoms. No abnormal signs were detected on general examination of the infant. Palpation of the abdomen revealed a large mass situated in the left upper abdomen

enchroaching upon the epigastric and lumbar regions. The mass was firm in consistency and fixed. There was no hepatosplenomegaly or free fluid in the peritoneal cavity. Routine haematological and biochemical investigations were within normal limits. Alpha-fetoprotein and vanillyl mandelic acid levels were not elevated. Plain x-ray of the abdomen revealed a large soft tissue mass in the upper half of the abdomen and barium studies and intravenous pyelography showed it to be situated between the kidney and left colon.

At laparotomy, a mass was found to be occupying the retroperitoneal space between the pancreas and the kidney displacing the surrounding structures. Complete resection of the tumour was carried out.

The excised specimen was 10 cm in diameter and contained cystic areas within solid tissues. Microscopic examination revealed amorphous tissue containing cystic spaces and various tissues consisting of mesenchymal epithelial, specially maldeveloped intestinal wall, ectodermal and neural tissues. No evidence of malignancy was noted.

The patient was followed up for a year and was found to be healthy.

Case 2:

A 6 months old infant was admitted with a history

*D. B. Gahukamble and Abdul Salam Khamage,
Department of Surgery (Paediatric), Faculty of Medicine, Al-Arab Medical University, Benghazi, G.S.P.L.A.J.*

of distension of abdomen of three months duration. There were no other symptoms. General examination showed mild anaemia but no other signs. On examination of the abdomen there was obvious protrusion of the left upper half, and a large mass occupying left upper half extending to the infraumbilical region and crossing the midline. The mass was nontender and fixed. Both the renal angles were not full and no free fluid could be detected in the peritoneal cavity. Routine hematological and biochemical tests including blood urea and serum creatinine were within normal limits. Plain skiagram of the abdomen showed diffuse calcifications (Fig. 1). Intravenous pyelography showed no proper outline of the pelvicalyceal system but delayed film showed the normal outline of the left kidney. At laparotomy, the tumour was protruding through the gastrocolic area stretching the pancreas laterally and duodenum and terminal portion of the common bile duct medially. It was intimately adherent to the inferior vena cava, aorta and the left kidney. The entire mass was resected including lateral half of the pancreas and spleen because they could not be separated from the tumour. Postoperative recovery was uneventful. The infant was followed up for the last 6 months and is doing well.

On gross examination, the removed mass was 16 cms in diameter, capsulated with smooth nodular surface. The cut surface showed highly variegated appearance with solid and cystic areas, bone and cartilage. The weight of the tumour was 850 gms.

Histopathology showed various tissues such as bone, cartilage, tendon, peripheral and central nervous tissue, ganglion (sympathetic), smooth and skeletal muscle, fat, fibroblasts, angiomatous, skin, respiratory, transitional and mucous secreting epithelium. Few islands of salivary and pigmented epithelium, possibly ocular, were also found.

DISCUSSION:

Due to rarity of occurrence of teratomas on the whole and especially those situated in the retroperitoneum, it is unusual to find a large series dealing with this tumour in a single institution. There are brief recent reviews summarising the clinicopathologic features (1, 3, 7). Clinically,

retroperitoneal teratomas grow silently and their presence is only noticed on protruberance of the abdomen. In both the infants described here, abdominal distension was noticed by the parents. Although these tumours can be situated anywhere in the midline, on either side of the spine, they are found more commonly on the upper left half of the retroperitoneum (5). Occasionally intestinal obstruction may occur (2), but despite its large size, it is unusual to find obstructive symptoms either in the gastrointestinal or urinary tract. In both infants, although displacement of the surrounding viscus was noticed, no clinical symptoms referable to the mass were present.

Plain skiagram of the abdomen may show calcification, tooth, or bony outlines. Calcifications are noticed in 40% of teratomas and are more common in the benign than in the malignant variety (1). Barium studies and intravenous pyelography are useful in assessing the exact relationship of the tumour to the surrounding structures.

The significance of the gross appearance of the tumour as a prognostic factor has been stressed earlier, in that cystic tumours tend to be benign whereas solid and large tumours malignant (1). Microscopically there is a conglomeration of tissues derived from the three germinal layers arranged in a haphazard way. In both patients, ectodermal as well as endodermal tissues were predominant to the mesenchymal elements. Intestinal mucosa and glial tissues were quite obvious. Multiple sections should be carried out to rule out the presence of malignancy.

The current hypothesis about their origin is that they arise from the multipotent germ cells (10). In the embryonic period, germ cells are situated among the endodermal cell lining of the yolk sac and migrate by amoeboid movement posteriorly along the dorsal mesentery towards the gonadal ridge in the posterior part of the abdomen. In this region the germ cells are incorporated in the developing gonads in the sixth week of embryonic period and later descend in the pelvis, in the ovary, or in the scrotum in the testis. These migrating cells may not proceed towards their destination or may rest in

abnormal sites, or be left behind in the retroperitoneum, where they may develop into teratomas (8). The mechanism by which these germ cells are induced into teratomas is not known. It has been postulated that these totipotent cells situated in the abnormal environment may undergo mutation and subsequent tumour formation (6).

Complete surgical removal at the first attempt is the treatment of choice. If removed totally prognosis is excellent. Although retroperitoneal teratomas are invariably benign in infants they become unresectable because of their strategic

position and close proximity with the surrounding vital structures. In both the infants described here, the tumour was adherent to the kidney, great vessels, duodenum, and terminal portion of the common bile duct. In the second patient the pancreas could not be separated from the anterior surface of the tumour safely and therefore partial pancreatectomy was carried out. Retroperitoneal teratomas have a high incidence of incomplete removal, therefore it has been suggested that adjuvant radiation therapy and chemotherapy might make the resection complete at the second sitting (1).

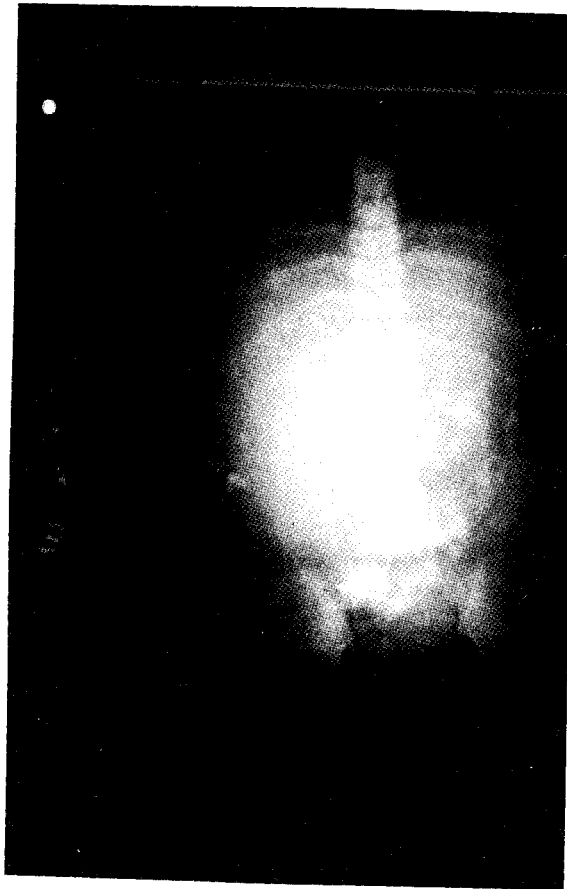


Fig. 1: Plain x-ray of the abdomen showing diffuse calcifications.

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NEWS

الأخبار

1) Dr. Amer Rahil Mohammed, the Secretary of the Peoples Committee of Al-Arab Medical University, had participated at the Meetings of the 26th Session of Arab Universities Union Council which was held at the Science & Technology University in Jordan during the period 24 - 26 April 1993.

2) Dr. Amer Rahil Mohammed, Secretary of the Peoples Committee of Al-Arab Medical University, and Dr. Abdul Hadi Moussa Mohamed, Sec. of the Peoples Committee of Faculty of Medicine had participated at the Conference of Arabization of Medicine and Medical Sciences Education (Applied Procedures) which was organized by the Bahraini Doctors Society during 16 - 18 Feb. 1993 in Bahrain.

3) Faculty of Dentistry at Al-Arab Medical University had hosted the 4th Magharbi Conference for Dental Surgery during the period from 31/4/1993 to 4/5/1993.

الخبر الأول :

شارك الأخ الدكتور عامر رحيل محمد أمين اللجنة الشعبية للجامعة في اجتماعات الدورة السادسة والعشرين لمجلس اتحاد الجامعات العربية التي عقدت في جامعة العلوم والتكنولوجيا بالمملكة الأردنية في الفترة من 24/26 من شهر الطير (أبريل) 1993 م .

الخبر الثاني :

شارك كل من الأخوة :

1. د . عامر رحيل محمد / أمين اللجنة الشعبية للجامعة .
2. د . عبد الهادي موسى / أمين اللجنة الشعبية لكلية الطب .

في مؤتمر تعريق تعليم الطب والعلوم الطبية في الوطن العربي (خطوات تطبيقية) الذي نظمته جامعة الأطباء البحرينية في الفترة من 16/18 من شهر النوار (فبراير) 1993 م .

الخبر الثالث :

استضافت كلية طب الأسنان بجامعة العرب الطبية (المؤتمر المغاربي الرابع لجراحة الأسنان الذي عقد في الفترة من 31/4/93 م إلى 4/5/1993 م .



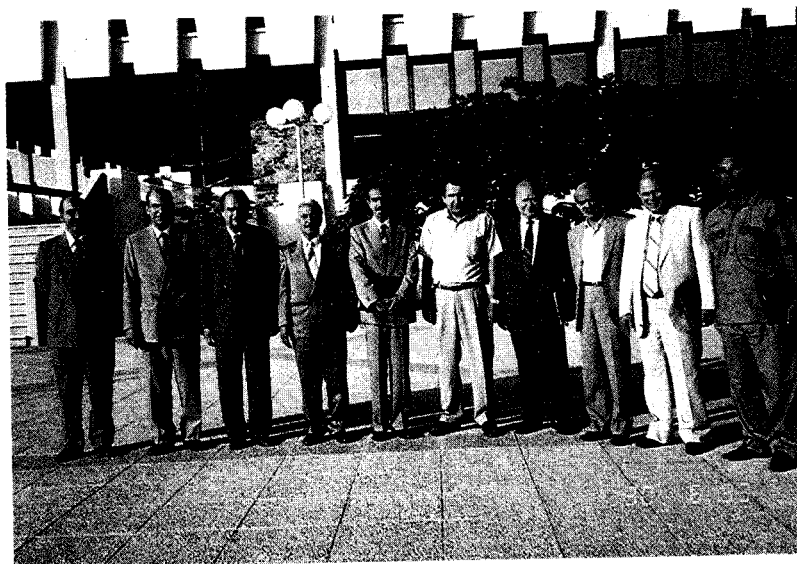
الأخ أمين اللجنة الشعبية لجامعة العرب الطبية يفتتح معرض المعدات الطبية على هامش أعمال المؤتمر المغاربي الرابع لجراحة الأسنان .



الخبر الرابع :

4) The Deans Council of Faculties of Dentistry at the Arab world held a meeting at the Faculty of Dentistry during the period from 29/6/1993 to 30/6/1993. Arab Faculties of Dentistry Council was formed at the end of these meetings.

عقدت لجنة مجلس عمداء كليات طب الأسنان في الوطن العربي اجتماعاتها بكلية طب الأسنان خلال الفترة من 29/6/93 م إلى 30/6/93 م انبثق من هذه الاجتماعات إنشاء مجلس كليات طب الأسنان في الوطن العربي .



مجلس عمداء كليات طب الأسنان في الوطن العربي .

الخبر الخامس :

5) Dr. Amer Rahil had headed the Great Libyan Jamahiriya Delegation at the World Health Organization's Meetings which were held in Geneva, Switzerland during 10/5/1993 to 14/5/1993.

ترأس الدكتور عامر رحيل محمد أمين اللجنة الشعبية للجامعة وفد الجماهيرية العظمى في اجتماعات منظمة الصحة العالمية التي عقدت في جنيف سويسرا في الفترة من 93/5/10 م إلى 1993/5/14 م .



الأخ أمين اللجنة الشعبية لجامعة العرب الطبية يتأس وفد الجماهيرية العظمى في اجتماع منظمة الصحة العالمية في جنيف

الخبر السادس :

6) Dr. Amer Rahil Mohammed headed the Libyan Delegation participating at the Ministers of Health of the Magharbi Union in their 6th Session meeting which was held during 5th to 7th July 1993.

شارك الدكتور عامر رحيل محمد أمين اللجنة الشعبية لجامعة العرب الطبية كرئيس للوفد الليبي المشارك في اجتماعات وزراء الصحة للاتحاد المغاربي في دورتهم السادسة خلال الفترة من 7/5 من شهر (يوليو) 1993 م .

الخبر السابع :

7) Al-Arab Medical University had hosted the 1st Scientific Conference for the Libyan Surgeons Society which was held during 28 - 30th Sept. 1993. During the Conference the 2nd International Book-Fair was arranged and several International publishers had participated at this Fair. Medical equipments exhibition was also arranged.

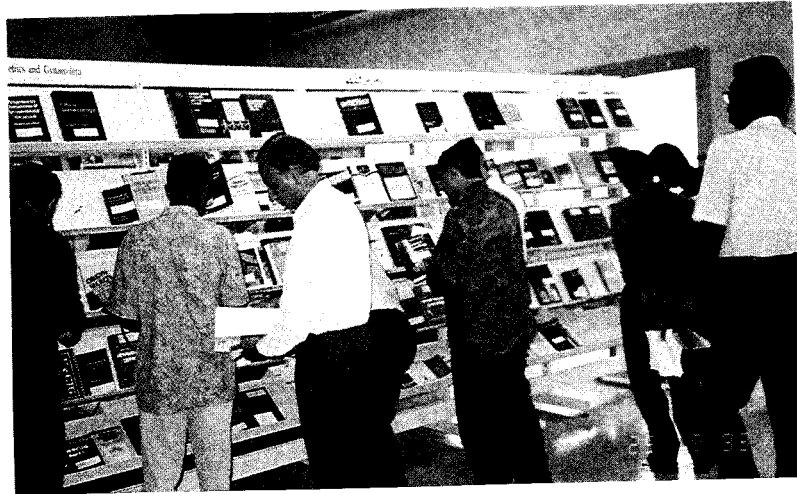
احتضنت جامعة العرب الطبية المؤتمر العلمي الأول لجمعية الجراحين الليبية الذي عقد في الفترة من 28 - 30 من شهر الفاتح (سبتمبر) 1993 . كما أقيم على هامش أعمال المؤتمر معرض الكتاب الطبي العالمي الثاني الذي شاركت فيه العديد من دور النشر العالمية ، وكذلك معرضاً للمعدات الطبية .



المؤتمر الأول للجراحين
الليبيين .



الأخ أمين اللجنة الشعبية
العامّة للصحة والضمان
الاجتماعي أثناء زيارته
لمعرض الكتاب .



معرض الكتاب الطبي
الثاني .

تعليمات للمؤلفين :

- 1- ترسل الأبحاث إلى رئيس هيئة تحرير مجلة قاريونس الطبية ص . ب . 18251 بنغازي - الجماهيرية العربية الليبية الشعبية الاشتراكية العظمى .
- 2- يشترط لقبول البحث عدم سبق نشره أو الاتفاق (الارتباط) على نشره في أي مكان آخر، كما لا يجوز إعادة ما ينشر في هذه المجلة الا بإذن من هيئة التحرير.
- 3- تقبل الابحاث من اي مؤلف في اية دولة .
- 4- تقدم المقالة (البحث) من نسختين مطبوعين على الآلة الكاتبة، باللغة الانجليزية مع ترك مسافتين بين السطر والآخر ومكتوبة على ورق ابيض، خالية من الأخطاء، مختصرة ومنسقة الاسلوب . كما يختار لها عنوان مختصر كرأس للموضوع ويستعمل في فهرست المواضيع مع بيان المصطلحات الواردة في البحث، ويكتب ذلك على ورقة مستقلة كصفحة أولى للمقال، كما يجرر عنوان البحث على الورقة الثانية، اما الورقة الثالثة فيطبع عليها اسم المؤلف او المؤلفين والجهة التي يتبعونها. وتتضمن الورقة الرابعة تقديم لموضوع البحث الأساسي . وعلى العموم يقدم المقال بالصورة التالية: ملخص - تحليل ومناقشة لجوانب البحث - التعريف - المراجع .
- 5- يفضل تقديم ترجمة عربية للملخص البحث وكذلك للعنوان واسم المؤلف والجهة التي ينتمي اليها وذلك في ورقة منفصلة في آخر المقال .
- 6- الجداول والرسوم البيانية والتوضيحية ينبغي أن تطبع كل واحدة منها على ورقة مستقلة مع وضع عناوين لشرح المضمون ويعرف به دون حاجة للرجوع الى الملاحق كما يشار الى اماكن المثبتات .
- 7- ترجمة مراجع المقالة وتنظم أبجدياً بأسماء المؤلفين وتكتب تأييث المراجع بالرقم وعلى سبيل المثال :
 - 1- براي - ج . ي (1930) - عامل الوراثة في مرض الربو وأمراض الحساسية الاخرى - مجلة برت الطبية : 1:384
 - 2- دفاص - ج . م . ، تالانستال - م . إ . ، ودوندي - ج . و . (1974) تقييم العقاقير المضادة للروماتيزم - لانست (المبضع) 214:39
 - 3- سوبل ج . ر . (1960) - استئصال اللوزتين في الطفل المريض بالحساسية عن بريجال - س . عوامل الحساسية الحديثة - دار ماكجروهل المتحدة للكتاب - نيويورك .
- 8- ترسل 25 نسخة من المقال المنشور الى المؤلف، ويتكفل بدفع قيمة ما يزيد على ذلك، كما ترسل النسخة الأصلية عند إعادة الطبع .
- 9- للاستعلام بخصوص نشر الأبحاث والاعلانات والاشتراكات تكون المراسلات باسم رئيس التحرير .

مجلة قاريونس الطبية

المجلة الرسمية لجامعة العرب الطبية
ص . ب : 18251 بنغازي
الجمهورية العربية الليبية الشعبية الاشتراكية العظمى

مجلة قاريونس الطبية نصف سنوية وتتناول العلوم الطبية . مجلد يحوي عددان احدهما في يناير والآخر في يوليو

السعر	العملة المحلية	العملة الأجنبية مع رسوم البريد
اشتراك سنوي	4 دينار ليبي	12 دولار
نسخة واحدة	2 دينار ليبي	6 دولار
50 مستخلص من البحث	5 دينار ليبي	15 دولار

تنبيه :

- لا تمثل المقالات التي تنشر في هذه المجلة وجهة نظر الكلية ولا هيئة التحرير ويعتبر الكاتب وحده المسئول عما فيها من آراء وعن صحة ما جاء في هذه المقالات .
- يرجى من الكاتب قراءة التعليمات والإرشادات المطبوعة في الصفحة التالية وينصح الراغبين في نشر إنتاجهم بقراءة الإرشادات المطبوعة خلف هذه الصفحة والتقيد بها .