

Study on frequency of inheritance trait for earlobes of Libya sample (Salouq, Benghazi and Tokara towns).

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Abstract

It is known that, there are two types of human ear lobes. free earlobes (unattached) which is dominant trait (E-) and attached earlobes that is recessive trait. There is limited studies on the frequency of these types among libyain population. The main goal of this study was to determine the human inheritance trait for earlobes and to see whether there is an effect for gender in this inheritance trait study . A samples of 1389 (679 male and 710 female) from students were involved. Results showed that the frequency of unattached type earlobe was 69.4%. and attached was 30.6 %. Both sexes in the population have higher frequency of unattached (65.5% in male and 73.1% in females) there was Statistically nonsignificant in female. (P value lower than 0.05, Chi-Square value of 23.2) was calculated where the null hypothesis was rejected . The states that normal distribution for Mendel are data on the basis of 3:1 ratio and this could be related to male Chi-square effect. In conclusion, the unattached earlobes is the most commonly type which is the dominant, in Libyan population. .This suggesting more studies are necessary including large sample size and observing further associated attribute to ear lobes such as blood groups that were needed.

Keywords : Attached and free earlobe, Gene frequency, Mendel genetics, Mendelian ratio,

الملخص بالعربي

من المعروف انه يوجد نوعين من فصوص الأذن البشرية. شحمة الأذن الحرة أو منفصلة (غير مرتبطة) وهي الصفة السائدة (E-) وشحمة الأذن المتصلة (المرتبطة) وهي صفة متنحية. هناك دراسات محدودة حول نسبة هذه الأنواع في المجتمع الليبي. كان

الهدف الرئيسي من هذه الدراسة هو تحديد الصفة الوراثية البشرية لشحمة الأذن وما إذا كانت هناك أي فروق بين الجنسين في تكرار النوعين . تم اختيار عينات من 1389 طالب (679 ذكر و 710 إناث). أظهرت النتائج أن معدل تكرار شحمة الأذن من النوع المنفصل بلغ (69.4 %). والمتصل كان (30.6 %). حيث كلا جنسين في العينة لديهم نسبة عالية من شحمة الأذن المنفصلة (الاناث 73.1 %) (الذكور 65.5 %) وهو ليس ذو دلالة إحصائية عند الأنث. قيمة P أقل من (0.05) ، و كانت قيمة مربع كاي الحسابية (23.2) حيث تم رفض الفرضية الصفرية التي تنص على أن التوزيع الطبيعي لمندل على أساس نسبة (3:1) وهذا يمكن أن يكون مرتبطاً بتأثير قيمة مربع كاي للذكور. في الختام ، شحمة الأذن المنفصلة هي النوع الأكثر شيوعاً والأكثر شيوعاً في الليبيين. و هذا يشير إلى مزيد من الدراسات حول الصفة المرتبطة بفصوص الأذن لأكثر عدد ممكن و متابعتها .

Introduction

In humans there are two types of earlobes -,free earlobes unattached and attached earlobes. This trait is inherited by is simple Mendelian inheritance effect is unlikely to be responsible for the earlobe types,[1], and this trait is controlled by single gene with tow alleles [2]. One of these alleles is dominant for another allele . The allele for free earlobe is dominant for second allele and this allele is recessive [3]. Nevertheless, some scholars reported that adjective influenced by several genes which is known as a polygenic inheritance pattern[4]. In addition, many people have intermediate earlobes, for instance, [5, 6] classified earlobes into three types, dependent on whether the attachment angle was acute, right or obtuse [7]. Latest genetic researches have recognized a few loci related with the trait earlobe attachment, that was analyzed as a semiquantitative phenotype (free, partially attached, or attached earlobes, respectively) [8,9]. The shape of the earlobes has a variety of genetic significance, depending to study analyzing the frequencies of the earlobe shapes in the Korean population [10]. The objectives of the present study are to determine the frequency of human genetic trait for earlobes among students of Benghazi University in Libya. In addition, to determine whether there are any sex differences in the frequencies of two types of ear lobes and to test the phenotype ratio for the sample and whether it is fitness to mendelian law.

Materials and methods

Data collection

I filled out a questionnaire from students of the university of Benghazi and the faculty of art and sciences Tokara, as well as the faculty of art and sciences Salouq . Table (1) shows the number of the students , The total number was 1389 divided into (679 males and 710 females) . The largest number was for university of Benghazi students where it was 677 (412 males and 265 females) , 541 (205 males and 336 females) , as well as 161 (62 males and 109 females) for Tokara and Salouq respectively were tested to study unattached and attached earlobes pattern in Libya.

Table (1) : - table shows the number of offspring with free and attached earlobes for male and female for three towns .

Country	Male	Female	Total
Benghazi	412	265	677
Tokara	205	336	541
Salouq	62	109	161
Total	679	710	1389

Statistical Analysis

The following statistical procedures were carried out, using SPSS software version 20 statistics package. The Chi-Square test was used to find the inheritance pattern of genetic trait (unattached and attached earlobes). Frequency of unattached and attached earlobes were calculated as follows.

$$\text{Frequency of attached earlobes} = \frac{\text{Number of attached earlobes}}{\text{Total population}} * 100$$

$$\text{Frequency of unattached earlobes} = \frac{\text{Number of unattached earlobes}}{\text{total population}} * 100$$

Results

Figure (1) shows the percentage of people have attached and free earlobes in the proportion studied, where it presents 30.6 % of the attached earlobe trait and 69.4 % of free earlobe trait .

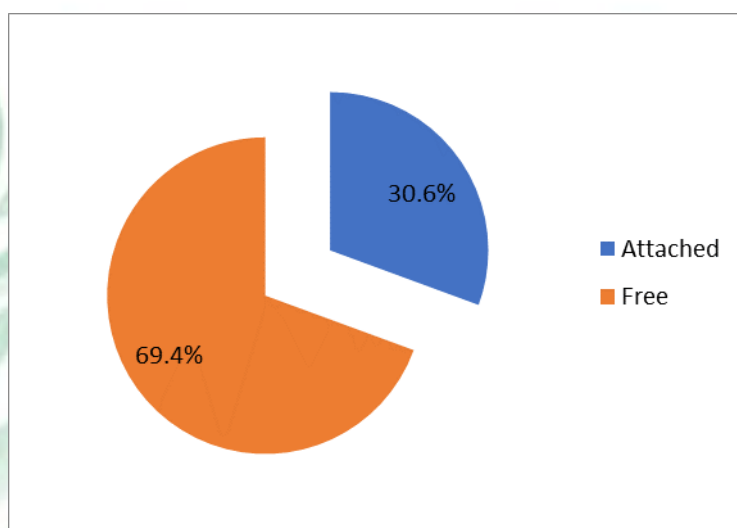


Fig – (1) : - The percentage of people having free and attached earlobes .

The statistical program SPSS showed the following results, the importance of the genetic normal distribution of earlobes and the measurement of their frequency . Table (2) shows the results of Chi-Square test is significant for total population (23.2) for Mendelian ratio of 3:1, while the Chi test nonsignificant for female (1.4) and significant for male (32.4) , where it was noted that the ratio mendelian to the phenotype the earlobe for total, male and female are (2:1, 2:1 and 3:1), so that has been rejected of total and male for the ratio mendelian and accepted of female .This is no similar to the Mendelian monohybrid inheritance using the punnet square. Table (2) shows that the total number of students who had attached and unattached, for total , male and female 425 and 964 –234 and 445 –191 and 519. In the same table there is calculation of the frequency of dominant of gene of free earlobes for total , male and female respectively (69.4, 65.5 and 73.1)% and frequency of receiver of gene of attached earlobes for total , male and female respectively (30.6, 34.5 and 26.9)% .

Table (2) : - table shows Chi-test and the Frequency of gene offspring with free and attached earlobes for male and female.

Earlobes	Attached	Unattached	X ²
Female			
Observed	191	519	1.4*
Expected	177.5	532.5	
Frequency	26.9%	73.1%	
Male			
Observed	234	445	
Expected	169.75	509.25	32.4
Frequency	34.5%	65.5%	
Total			
Observed	425	964	
Expected	347.25	1041.75	23.2
Frequency	30.6%	69.4%	

* chi square tab. (df-1 p 0.05) = 3.841

Table (3) shows the results of Chi-Square test is high significant for Tokara town (56.86) in male and nonsignificant for Tokara town (0.57) in female while the results of Chi-Square test is significant for Benghazi town (7.08) in

female and nonsignificant for Benghazi town (1.29) in male . But Salouq town is very close to Chi-Square tabularity (4.48) in male and nonsignificant (0.03) in female. All of these results affected the total results where it appeared is high significant for Tokara town (16.37) and followed for Benghazi town but nonsignificant for Salouq town (2.12) .

Table (3) : - table shows Chi-test and the Frequency of gene offspring with free and attached earlobes for male and female for three towns.

Country	Male	Female	Total
Benghazi	1.29*	7.08	6.51
Tokara	56.86	0.57*	16.37
Salouq	4.84	0.03*	2.12*
Total	32.4	1.4*	23.2

* chi square tab. (df-1 p 0.05) = 3.84

Discussion

Total number of students 1389 in Benghazi university from different home where the return hom was related to about 38 between the city and the village was involved. The majority of them (male and female) had free earlobes 69.4 % while 30.6 % had attached earlobe in the Mendelian ratio of 3 : 1. These results supports the view of [11] who found 74.14 % and 25.86 % . Also, [12] correspond with a record 74.31 % and 25.68 % . In the same way, [13] found that 78.4 % and 21.6 % in Turkish students and [14] observed 64.9 % and 35.1 % in Indian while 68.39 % and 31.61 % in Nigeria populations[11]. Similarly, [16] showed that 84.29 and 15.71 % for unattached and attached earlobes respectively. Conversely, there were Koreans study found that attached type earlobe was the most common type 61.2%. [10], [15] observed 68 % and [1] 80 % . These results is in conformity with single gene Mendelian dominant – recessive fashion , [11]. As for the results the female and male individuals of free and attached earlobe trait are (73.1 – 26.9 and 65.5 – 34.5) respectively. Furthermore, there was nonsignificant difference among female in having free earlobe .Despite the convergence of the results, the female result was accepted and the male result was rejected according to the law Chi- square. The different results between male and female study in the Mendelian ratio could be related to small size of the sample , gene flow between population, genetic drift and area

or extent geography . The inheritance pattern of genetic trait is controlled by autosomal genes which are recessive for attached and dominant for free earlobe, [12], these earlobe variations are due to the differences in the ages of offspring since earlobe increases with age and not polygenic inheritance, [2] The samples were subjected Chi-Square test is 23.2, results showed not identical to the mendelian inheritance, as well as the results of male Since the separate earlobes has different degrees [6] based on whether the attachment angle [7]. Just a suggestion, since the attached earlobe is a polygene, [8 , 9, 10], it means that it is the dominant characteristic and not free earlobe . Especially noting the obvious diversity and differences in the frequency of separate and connected alleles, indicating that the attribute is not fully dominant trait. However, it was observed in the study the effect of gender and geographical on the results Tokara town (56.86), Salouq town (4.48) in males, compared with the Benghazi town (7.08) in female, which we did not know the reason despite the geographical, environmental and social diversity variety

Conclusion : -

The results of this study indicate that, the presence of unattached earlobes people (both sexes) have higher frequency about 69.4 % are the dominant and attached earlobes people about 30.6 % are the recessive, it is in agreement with the majority of research . The study pointed out that the gender has a relationship with the ear lobule .The findings in this study suggest that the unattached earlobe type is the most common among Salouq , Benghazi and Tokara towns , and the proportion of earlobe types among males and females is significantly different. Further studies are needed to understand the genetic background of earlobe types among these towns .This study proves that the population is not Hardy-Weinberg equilibrium and provides strong evidence for the polygenic or polyallelic nature or Pleiotropic effect of earlobe attachment and offer insights into the biological basis of normal and abnormal ear development.

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