Incidence of Thalassemia trait among group of Adolescents In Najaf

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Abstract

Aim of the study : to determine the incidence of thalasseima trait among adolescents in Najaf .

Method : 240 adolescents were studid at Najaf governorate,by hemoglobin electrophoresis , to detect Thalaesseima trait .

Result : eleven (11) cases were found to have elevated HbA2 level (4.58%) ,which is located with in the international records of thalassemia trait .

Conclusion : the percentage of 4.58% of thalassemia trait , represent an important result , which gave us step to make real decisions , by all means to prevent the spread of the disease.

Introduction

Thalassemia are group of heritable hypochromic anemia of varying degree of severity [1] This group is caused by genetic defect in polypeptide chains synthesis of hemoglobin (Hb) [2] The underlying genetic defects include total or partial deletions of globin chain genes and nucleotides substitutions, deletions, or insertion[3] with deletions, more than one gene may be involved and may contribute to singificant clinical conditions. Thalassemia is inherited on an autosomal recessive basis.A pair of genes responsible for each type of polypeptide chain in the Hb is inherited, i.e.one gene from each parent with the result that each gene of an allelic pair controls the synthesis of half of the total quantity of its specific peptide chain[4]. Depending on the genes responsible for the varies types of B-chain are distributed, and on their interactions with other genetically separable froms of thalassemia result.These range from asymptomatic thalassemia minor (trait), to the severe coolys anemia .Thalassemia trait characterized by presence of high HbA2 level [2]. Thalassemia intermedia, refers to that group of patients who are able to remain clinically well without transfusions with hemoglobin level range between 7 – 10 gm /dl. Thalassemia major , was first described in 1925 by Cooly in Detroit, and is therefore referred to as coolys anemia.The prevalence of thalassemia is highest in countries bordering on mediterranean sea, much of Africa, the middle east, the Indian subcontinent, and southeast Asia. The gene carrier rate range form 3 % in Americans of Italian ancestry to 40% in regions of east Asia[6]. The diagnosis of coolys anemia depends on presence of very high level in the red blood cell of fetal hemoglobin (Hb F). More than 90 % of persons with B – Thalassemia trait have diagnostic elevations of HbA2 of 3.4 - 7 % (6, 7). Hemoglobin electrophorsis to identify HbA2 and globin chain separation are used to resolved diagnostic difficulties [7]. **Aim of the study**: to determine the incidence of B- Thalassmia trait in the adolescents age 14 – 16 year in Najaf governorate.

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Methods

The study was done in Najaf governorate during the period Jan 2002 – April2002.The target of our study are 240 (180 boys , 60 girls), selected randomly apparently healthy adolescents, age 14 – 16 years studying at twelve [12] secondary school .The questions paper include :family history of blood disease. parents (relative,unrelative), source of family (ancestry), time of residence in this governorate . Blood sample was taken voluntarily from studied pupils, which include 2.5 ml of blood in an anticoagulant containing tubes , send for Hb electrophoresis to detect HbA2 level and blood indices. Serum ferritin also assessed by another to identify those with iron deficiency anemia .Those who have low serum ferritin (less than 30 ng/dl) iron tables in dose of 6 mg /kg /day for one month was given , and then restudied for Hb electrophoresis.

Results

From two hundred forty (240) adolescents who were studied, (180 male , 60 female) , 120 were taken from rural area , and equal number were from the center of the city . Form the total number (240) , 140 cases have close or far related parants , while (100) cases with cases with unrelated father and mothers . this is well clarified by tabe 1 . Table 2 demonstrate that among the (240)pupils who were studies,we found that 220 cases (91.62%) and their family ,were originally from this city , while twenty (20) cases (8.35%), had one or both parent, immigrated form the south of Iraq after the year 1980. Eleven (11) cases were found to have Hb A2 level ranging between 4.6 – 7 % , by Hb – electophpresis,this might represnts 4.58% of Thalassemia trait among studied cases. Six (6) of them are female and five (5) are male (ratio 1.2/1). Among the eleven (11) cases with high HbA2, nine (9) of them (81.8 %) have parents who were close relative (second , third), this is well clarified by table 3, which also shows the percentage of HbA2 among them, and the sex of the cases.Two cases with high HbA2 have positive family history of repeated blood transfusions.Seven (7) of those cases with high HbA2, were found to live in urban area, while the remaining four (4) were form rural area. Table 4 clarified that among the eleven (11) adolescent with high HbA2, there is three (3) cases originally form this city, while eight (8) of them, have or both parent origin from south of Iraq (Basra,Nassiria,Omara), who were immigrated after the year 1980.

Table(1)parent consanguinity of the studied cases.

Total	2cd dagree	Far relative	Un related
240	100	40	100
%	41.66	16.6	41.66

Table (2) parents origin of the 240 cases

origin	number	%
Najaf	220	91.65
One parent out of Najaf	15	6.35
Both parent out of Najaf	5	2
Total	240	100

Table(3) demonstrate the % of HbA2 , Sex, and parents consanguinity in the cases with high HbA2 .

	Sex	HbA2	Related parent	Un related parent
1	Female	5.4	*	
2	Female	5	*	
3	Male	6.4	*	
4	Female	7	*	
5	Male	7		*
6	Female	7	*	
7	Male	5	*	
8	Male	6.3	*	
9	Female	7	*	
10	Female	7		*
11	Male	6.8	*	

Table (4) the origin of the 11 cases with high Hb2

	sex	origin	One parent out of Najaf	Two parent out of Najaf
1	Female		*	
2	Female			*
3	Male	*		
4	Female		*	
5	Male			*
6	Female	*		
7	Male		*	
8	Male			*
9	Female	*		
10	Female			*
11	Male			*

Table(5) number and percentage of carriers state in our and American studies

	Our study	American study
Total	240	25274
Number of carriers	11	693
Percentage	4.6 %	2.4 %

P-VALUE < 0.05 $X^2 = 2.8$

Discussion

This study has shown that the percentage of 4.58. of adolescents with high Hb A2 level (5 – 7%) , comprised the total incidence of thalassemia trait in this city , with its different ancestry , and origin of its families, including those who have been immigrated form the southern part of Iraq, after the year 1980.This incidence is located in the lower range of international incidence of thalassemia trait all over the world (5 – 35%) (9) . This result is also correlate well with another survey done on adolescent of Mediterranean ancestry in America, in which (25274) adolescents was screened for HbA2 level, which show that (693) cases were carriers. This means that one of every thirty six adolescents have high HbA2 (Table 5). The P-value is less than 0.05, was considered statically significant. Most of adolescents with high HbA2 (8 of 11), were form southern origin (one or both parents), while only three of them were originally form this city , which might indicate the real low incidence of thalassemia trait among the people of this city i.e. 1.25% only , inspite of higher number of students originally descending form this city (220/240). The higher incidence of thiw disease in urban area (7out of 9) can be explained by that ; most immigrated families, lived in urban area, becouse of easiest to get work and employment in the center of city than in the rural area.Two of adolescents studied (0.83%) of the total were found to be product of unrelated parents, while nine (9) of them (3.75 %) had one or both parents from near or far relative, this result is correlate well with the pattern of inheritance (8,10,12) Finally the female to male ratio of affected person (1.2/1) in this study , in spite of higher number of studied male, than female, which might be explained by the following : four (4) out of the six (6) affected female, were form relate families, and most of them were originally from southern governorates. Two cases were found to have family history of blood transfusion depending anaemia there is no clear evidence of thalasemia being the cause for that. Table 6 demonstrate the relationship between the percentage of HbA2 and sex distribution in which is no significant difference was shown (P-value more than 0.05) this in cnight be due to small sample taken, and further studies need to hightlighting this issue

Recommendations

Thalassemia is preventable disease (13). Screening of thalassemia is the most impotant means of checking the spread of the disease in the society, prevention can be achieved with the help of the following recommendation

1-PUPLIC EDUCATION which can be achieved by occasional reminders through the mass media (television , and radio discussion) frequent talks to smaller group in school, and through printed information booklet in plain simple language, to clarify the details about the disease process and its complications.

2-POPULATION SECREENING for the identification of carriers as it is implicated in another countries (14) required for identification of carriers state.

3-GENITIC COUNSELLING should be offered to every couple and individuals concerned., the risk should always being pointed out.

4-SPCIAL DIAGNOSTIC test for thalassemia carriers and trait, should be offered by special law, for testing every couple before marriage . to detect carrier state and then to explain further risk behind coupling of one or two carriers parents.

5-ANTENATAL DIAGNOSIS which has had an increasing influence in the reduction of homozygote births.The availability of antenatal testing in our country will certainly increase its importance if available and religiously acceoptable. in prevention the spreading of this disease.

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