

Clinical study of β -thalassemia major patients

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Abstract

This study was conducted in maternity and children hospital thalassemia center in Hilla/Iraq to determine the biochemical changes of blood serums for thalassemia patients and healthy as control ,age range between (2.5 -20) year (males and females).

The biochemical parameters were included total protein ,albumin ,triglyceride , RBC (red blood cell) ,Hb (hemoglobin) and PCV (packed cell volume).

The study revealed a significant differences in total protein which was (5.84 \pm 1.73) and (5.41 \pm 1.38) g/dl for patients (male and females respectively ,where as it was (7.54 \pm 0.50) and (7.55 \pm 0.51)g/dl for healthy (males and females) respectively.

our results indicated a significant differences in albumin which was (3.66 \pm 0.63) and (3.98 \pm 1.01) g/dl for patients (male and female) in sequence whereas (3.90 \pm 0.35) and (3.93 \pm 30)g/dl (male and female) for healthy respectively.

The results revealed a significant differences in T.G (triglyceride) which were (108.7 \pm 41.04) and (163.33 \pm 11.92) g/dl (male and female) for healthy and patients respectively. All other parameters RBC ,Hb and PVC showed a significant differences between healthy and patients .

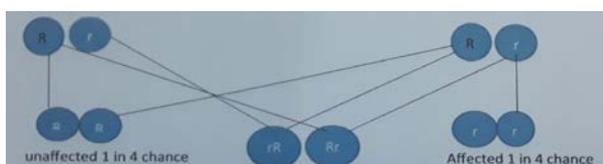
Key words: total protein ,albumin ,T.G

INTRODUCTION

The major thalassemia is the most severe form of beta thalassemia it develops when beta globin's are missing(1).the symptoms of the major thalassemia generally exist before a child second birthday (2).untreated thalassemia major leads death by heart failure(3). The severe anemia related to this status can be threatening other signs and symptoms include frequent infections a poor appetite failure to thrive , jaundice and enlarge organ(4).

This type of thalassemia is so severe because it demands regular blood transfusion(5).there are three main types of thalassemia ,beta which include the subtype major and intermediate alpha which include hemoglobin and haemoglobinopathy hydrops fetalis and thalassemia minor(6).thalassemia is a group of genetic disorder occur mainly due to defective formation of globin chain of hemoglobin molecule of the RBC breakdown occur at an early period due to abnormal globin chain unable to protect RBC in oxidative stress(7). In thalassemia the rate of destruction of RBC is so rapid that is exceeds the liver capacity to metabolize the excess bilirubin(8). About 190 million people throughout the world have genetic mutations associated with different hemoglobin pathies(9). People with thalassemia minor don't usually have any symptoms if they do, it is likely to be minor anemia(10). Thalassemia minor classified to α -minor and b-minor in α -minor cases two genes are missing where as in β -minor one gene is missing (11).

The genetic pattern of inheritance of β -thalassemia is as shown below (11)



MATERIALS AND METHODS

The study was conducted in thalassemia center of maternity and children hospital of Hilla city to study the biochemical parameters in blood serum for thalassemia patients.

The study was focused on the determination of total proteins ,albumin ,triglyceride ,PVC ,Hb and RBC in two sexes for healthy and patients aged between (2.5 \pm 20)year. 5 ml of venous blood was with drawn by disposable syringes divided in two portions, first portion was transferred to coagulant for determination of hemoglobin and platelets. The second portion was transferred to plain poly ethylene tube containing gel as clot activator for serum separation and centrifuged at 4000 rpm for 10 min (13). The level of triglyceride were tested by enzymatic colorimetric method(14). For measuring total protein we used (kit) type Bilobo reagents total protein and then the samples were putting in wave length system (15) .

Statistical analyses

The Statistical analysis was carried out using SPSS version 20 PV 0<0.05 was considered statically significant.

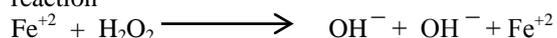
RESULTS AND DISCUSSION

Table number-1- revealed that were significant differences value for healthy and patients in RBC measurement for both males and female which were (3.55 \pm 0.94) and (3.5 \pm 0.8) million cell ml sequentially whereas the RBC for healthy were (4.0 \pm 0.25) and (4.5 \pm 0.14) for males and females sequentially. It obvious from the same table that hemoglobin value for males and females were (8.60 \pm 2.5) and (8.44 \pm 2.4) g/dl ,while the sequentially PVC (packed cell volume) of patients appeared significant differences for males and females which were (28.7 \pm 8) and (28.35 \pm 7.5) g/dl , whereas sequentially those were (43.66 \pm 1.45) and (24.25 \pm 1.42)g/dl for healthy (males and females) . from the same table we found that total protein value was showed significant differences between patients and healthy which were (5.48 \pm 1.73) and (7.55 \pm 0.51) g/dl for patients and healthy sequentially.

Table (1) blood analysis , total protein , albumin and TG thalassemia patient

P value	95% C.I.		Mean ± SD	N		Variable
	Upper	lower				
p< 0.05	3.90	3.16	3.55 ± 0.94	23	♂	RBC (10 ¹² /L) patients
	3.99	3.18	3.51 ± 0.86	20	♀	
p< 0.05	4.79	4.51	4.6 ± 0.25	15	♂	RBC (10 ¹² /L) controls
	4.64	4.47	4.5 ± 0.14	12	♀	
p< 0.05	9.64	7.72	8.6 ± 2.5	100	♂	Hb for patients (g/dl)
	9.54	7.25	8.44 ± 2.46	20	♀	
p< 0.05	13.51	12.9	13.26 ± 0.6	20	♂	Hb for controls (g/dl)
	12.83	12.33	12.69 ± 0.42	12	♀	
p< 0.05	31.70	25.69	28.70 ± 8.05	100	♂	PVC for patients (g/dl)
	31.87	24.82	28.35 ± 7.54	20	♀	
p< 0.05	44.46	43.86	43.66 ± 1.44	15	♂	PVC for controls (g/dl)
	43.15	41.34	42.25 ± 1.42	12	♀	
p< 0.05	31.70	25.69	28.70 ± 8.05	100	♂	PVC for patients (g/dl)
	31.87	24.82	28.35 ± 7.54	20	♀	
p< 0.05	6.1846	4.7792	5.4819 ± 1.7397	26	♂	Total protein for patients (g/dl)
	6.0846	4.7493	5.4168 ± 1.3849	19	♀	
p< 0.05	7.8237	7.2683	7.5460 ± 0.5015	15	♂	Total protein for controls (g/dl)
	7.4810	7.2670	7.5540 ± 0.5183	15	♀	
p< 0.05	3.94	3.39	3.66 ± 0.63	23	♂	Albumin g/dl for patients
	3.97	2.85	3.93 ± 1.01	15	♀	
p< 0.05	4.09	3.70	3.90 ± 0.35	15	♂	Control albumin (g/dl)
	4.18	3.97	3.98 ± 0.30	12	♀	
p< 0.05	108.7	41.04	2.915	15	♂	T.G control (g/dl)
	102.03	38.6	2.48	12	♀	
p< 0.05	163.33	11.92	6.48	25	♂	T.G patient (g/dl)
	159.6	12.12	5.67	23	♀	

The decreasing of total protein quantity for patients is due to iron over load in liver tissues that causing loosing of liver function for enzyme biosynthesis(16) such as transaminase and transferases which both of them very important for metabolism (17) also it might be due to the oxidative stress of (OH) radical as shown in this chemical reaction



From the same table-1- albumin values indicated a significant differences which were (3.66 ± 0.63) g/dl and (3.93 ± 0.01) g/dl for males and females in patients , whereas they were (3.9 ± 0,35) and (3.98 ± 0.3) g/dl for males and females in healthy sequentially . The reason of albumin decreasing in patients for both sexes it might be to iron over loaded (17) as mentioned before and might be interfere with enzyme system detective levels causing an increased risk of liver abnormalities.

CONCLUSIONS

The results from our study indicated that Beta thalassemia major was abundant disease in some people of Hilla city aged between 2.5-20) years especially childhood stage so they might be treated (early to prevent the progressing of this disease between them .

Acknowledgment

We would like to thank thalassemia center of Hilla hospital and the patients and healthy who participate and facilitate our study sincerely thanks to Duaa AL-Asaddy assistant lecturer for her helpful.

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