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RESEARCH ARTICLE

EVALUATION OF LIVER AND RENAL FUNCTION TESTS IN B – THALASSEMIA MAJOR PATIENTS IN MISSAN PROVINCE.

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Abstract

This study was planned to evaluated some function tests in liver and renal in patients with thalassemia by measuring aspartate aminotransferas (AST) , alanine aminotransferas (ALT) , bilirubin, urea , creatinine , glucose and feeritin. This study was carried out in center of blood diseases and tumors in Missan province. 50 patients with β- thalassemia (23male and 27 female) were included in this study. Their ages ranged between 2- 21 year. 50 matched normal individuals were taken as control group.

In the present study AST and ALT were significantly decrease in β-thalassemia patients than in the control ($p<0.05$). creatinine and ferritin were significantly higher in β- thalassemia patients than in control group ($p<0.01$). The mean values of other parameters including bilirubin, urea and glucose were found to be unchanged.

Introduction:-

Thalassemia had been considered the most common genetic disorder worldwide. It occurs in a particularly high frequency in abroad belt extending from the Mediterranean basin through the Middle East, Indian subcontinent, and South East Asia (1) . β – thalassemia is one of the most common single – gene inherited conditions in the world (2) . Al most 70.000 infants are born with β – thalassemia worldwide each year, and 270 million people are carriers of haemoglobinopathies (3, 4) . β – thalassemia major is a life threatening anemia which is characterized by ineffective erythropoiesis , bone marrow expansion and increase destruction of defective red blood cells (5 , 6) . The development of regular transfusion therapy and iron chelation has dramatically improved the quality of life and transformed thalassemia from a rapidly fatal disease to a chronic disease compatible with prolong survival (7) . However, persons receiving multiple transfusions as part of the treatment for thalassemia , are faced with problem of iron overload and consequent metabolic derangements (8) . The iron overload may have adverse effects on several organs including heart, liver, endocrine glands, lungs and kidneys (9) . During the last years, liver disease have emerged as a major causes of mortality in patients with thalassemia major (10) . The aim of present study is to evaluate the possible changes of conventional liver and renal function tests in transfusion dependent β – thalassemia patients in Missan province

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Material and Methods:-

Study design and subjects:-

The present study was carried out in center of blood diseases and tumors in Missan province, from 50 patients (23 male and 27 female) having age group(2 – 21) year and same number of control subjects having age group (2 – 24) year .

Biochemical analysis:-

8 ml of the blood was poured in a plane container and then centrifuged after clotted. Serum was kept as – 20c^{o} in sterile condition till used. Aspartate aminotransferase (AST) , alanine aminotransferase (ALT) were determined using Reitman and Frankel (11) . Serum glucose was determined according to Trinder (12) , serum bilirubin was measured by using Mallory and Evelyn (13) , serum ferritin assayed by Forman and Parker (14) , serum urea was determined according to Wills and Savory (15) and serum creatinine was measured by using Tietz (16) .

Statistical analysis:-

The data obtained during the current study were analyzed statistically to determine the significance of the different parameters by mean of student's t – test. The values present as mean ± SE (17).

Results:-

Fifty patients were studies in center of blood disease and tumors in Missan province .Twenty three (46%) patients were male and twenty seven (54 %) were female , while twenty nine (58 %) control were male and twenty one (42 %) control were female (Table , 1) .

The values of liver function investigations in thalassemia patients and control groups are shown in table (2). AST and ALT were found significantly decrease ($p< 0.05$) in thalassemia patients compared to control group. While the bilirubin was no significant difference between two groups.

Tables (3) represent the activity of renal functions in thalassemia patients and group. It was found no significant difference between two groups in urea. Whereas, creatinin was found a significant increasing ($p< 0.01$) in thalassemia patients than control group .

The values of serum glucose and serum ferritin in thalassemia patients and control group are shown in table (4). Serum glucose was no significant difference of both two groups. While the serum ferritin was increased significantly ($p< 0.01$) in thalassemia patients compared to control group.

The study showed thirteen (26 %) with blood group A , sixteen (32 %) with B , two (4 %) with AB and nineteen (38 %) with O (Table , 5)

Table 1:- Distribution of β- thalassemia patients and control group according to the sex.

Groups	Male		Female		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Control	29	58	21	42	50	100
thalassemia patients	23	46	27	54	50	100
Total	52		48		100	

Table 2:- Liver function investigations in β- thalassemia patients and control group.

Parameters	B -Thalassemia patients	Control	P value
AST(U/ L)	10.72±1.64	28.26±2.79	0.05
ALT (U/ L)	12.02±1.71	20.86±2.66	0.05
Bilirubin (mg /dL)	1.53±0.29	1.39±0.34	NS

∗Values are expressed as mean ± SE.

∗ NS: Non-significant.

Table 3:- Renal function investigations in β- thalassemia patients and control group

Parameters	B-Thalassemia patients	Control	P value
Urea (mmol /L)	5.80±0.24	5.56±0.19	NS
Creatinin(mmol /L)	71.64±1.23	28.42±0.91	0.01

∗Values are expressed as mean ± SE.
∗ NS: Non-significant .

Table 4:- Serum glucose and serum ferritin in β- thalassemia and control group.

Parameters	B- Thalassemia patients	Control	P value
Glucose (mmol/L)	5.90±0.37	5.38±0.16	NS
Ferritin (ng /ml)	2922.45±498.73	75.20±16.60	0.01

∗Values are expressed as mean ± SE.
∗ NS: Non-significant.

Table 5:- Percentage distribution of β – thalassemia patients according to their blood groups.

Blood groups in β – thalassemia patients	Number	Percentage %
A	13	26
B	16	32
AB	2	4
O	19	38
Total	50	100

Discussion:-

Thalassemia is recognized as the most prevalent genetic blood disorder in the world . However , β – thalassemia the most common autosomal single – gene disorder worldwide , found in more than 60 countries with a carrier population of up to 150 million (18) .

The significant decrease in the liver enzymes level AST and ALT in present study is agreed with the finding of Ismail *etal*.(19) . Whom found significant decreased in AST and ALT in thalassemia patients compare to control. Liver is affected by secondary iron overload , The liver plays a central role in iron homeostasis. In addition to iron released from transfused red cells, an enhanced rate of gastrointestinal iron absorption has been suggested. This excess iron is initially confined to the Kupffer cells but when transfusion requirements produce massive iron overload, spillover to hepatic parenchyma cells quickly occurs, with the risk of late development of fibrosis and cirrhosis(20).

The difference was statistically significant in creatinine of β – thalassemia patients compare to control. This is agreement with Al- Hassani *etal*.(21) whom found significant increased in serum creatinin level in thalassemia compare to control .The increased level of serum creatinin may prove that treatment of β – thalassemia patients with blood transfusion and iron chelating therapy provide the chance for normal growth with increasing body mass index (22) . These results may also indicate that some deterioration in glomerular functions regarding creatinine filtration might be expected in the individuals (23). Many studies showed that serum ferritin was increased in β – thalassemia patients than in control subjects (24 and 25). Thalassemia patients who had multiple transfusions had increased serum iron and ferritin level (26). Serum ferritin is a useful screening test for the initial diagnosis of thalassemia (27). However, serum ferritin protein is an acute phase reactant, rising with any inflammation process from infection through chronic disease, to determine whether a high serum ferritin protein is due to iron overload or inflammation, it has been also necessary to determine serum iron and transferrin (28).

The results about blood groups in present study are agreed with the finding of other studies (29 and 30). Blood group O was the dominating blood group among patients then comes blood group B , A and AB .Transfusion center in Baghdad (1988 – 1993) recorded than blood group O shows the highest percentage (31%) among people attending the blood bank for giving blood then comes groups A, B and AB . Higher prevalence of blood group B in the thalassemia patients than group A could be due to chance only or possibly that people with group B are more prone to develop thalassemia, a suggestion which need to be studied in a wider and more generalized (31)

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