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Research Article

**ASSOCIATION OF THALASSEMIA WITH SERUM FERRITIN
AND THYROID FUNCTION**¹Dr. Ammara Rasheed, ²Dr. Zunaira Zulfiqar, ³Dr. Syeda Nazish Kazmi¹Sheikh Zayed Medical College, Rahim Yar Khan²THQ, Daska³Wapda, Hospital**Abstract:**

Objective: to find correlation between serum ferritin and thyroid stimulating hormones among thalassemia major patients.

Methodology: The study included both male and female patients with diagnosis of thalassemia major and study was conducted at Mayo Hospital, Lahore, Pakistan over period of 6 months in 2017 by following cross sectional study design on 66 diagnosed cases.

Results: mean patient age was 8.7 ± 2.5 years. Mean blood transfusion was 7.8 ± 2.6 years. Mean serum TSH 3.8 ± 2.2 μ IU/ml.

Conclusion: A statistically insignificant correlation between serum ferritin level and TSH level was observed among beta thalassemia patients.

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INTRODUCTION:

Beta thalassemia is the most common hemoglobinopathy in Pakistan. Iron chelators therapy is needed in such patients who suffer raised serum ferritin level as a result of multiple blood transfusions and iron load. Iron overload is ten times higher than that of normal individuals in thalassemia major patients, 2/5 patients do not receive iron chelation therapy at all. The results of using iron chelators are very fruitful in cases of beta thalassemia major individuals [2]. Association of hypothyroidism with beta thalassemia major was studied by Asad ZT, et al. The association possibly is due to iron overload. Thus all multiple transfusion patients must get their thyroid function tests done [3]. Similar association was studied by Waseem Z, et al. [1] in which negative correlation was concluded. Thus, there is need for more research data in order to figure out the mechanism and exact incidence of correlation of hypothyroidism with hemoglobinopathy.

METHODS:

The study included both male and female patients with diagnosis of thalassemia major and study was conducted at Mayo Hospital, Lahore, Pakistan over period of 6 months in 2017 by following cross sectional study design on 66 diagnosed cases.

Inclusion criteria was patients with beta thalassemia major, on blood transfusion for last 5 years, both males and females with age of 6 to 15 years or who were taking blood transfusion for 1 to 3 times in a month.

Those who were undergoing bone marrow transplantation, had history of chemo or radiotherapy, thyroid disease, liver, kidney disease, on alcohol or any other drug abuse, tumor, were excluded from the study.

Before latest transfusion the blood sample was drawn from patients. Chemiluminescence method on hormone analyzer was used for determination of serum TSH and serum ferritin. A standard treatment protocol was adopted for all patients and data collection was done on a proforma.

Statistical analysis using SPSS version 22 was done. Age, duration since when patient was undergoing transfusions, TSH, ferritin level were the quantitative variables. Gender was considered the qualitative variable. Qualitative data was presented in the form of percentages and frequencies. Mean serum TSH and ferritin was correlated by Pearson coefficient correlation. Effect modifiers were controlled by stratification. T test was applied. P value less than 0.05 was considered significant.

RESULTS:

Mean patient age was 8.7 ± 2.5 years. Mean blood transfusion was 7.8 ± 2.6 years. Mean serum TSH 3.8 ± 2.2 μ IU/ml. serum TSH level and serum ferritin correlation is presented in table 1. Results obtained from study have been presented in the form of tables.

Table 1: correlation between TSH and serum ferritin.

Serum ferritin ng/dl	TSH	
	Pearson correlation	P value
	-0.014	0.911

Table 2: TSH and serum ferritin level between both genders.

Gender	n	Mean	SD	P value
Mean TSH level				
Male	43	3.8	2.2	0.96
Female	23	2.7	2.4	
Serum ferritin level				
Male				0.155
Female	43	3296	1752	
	23	2697	1301	

Table 3 comparison between two age groups.

Age group	n	Mean	SD	P value
Mean TSH				
6 to 10 years	50	3.6	2.1	0.451
11 to 15 years	16	4.1	2.6	
Ferritin level				
6 to 10 years	50	3005.9	1587	0.474
11 to 15 years	16	3342.06	1566	

Table: 4 comparisons on basis of duration of blood transfusion.

Duration of blood transfusion	n	Mean	SD	P value
TSH				
1 to 3	53	3.6	2.11	0.343
4 to 5	13	4.3	2.8	
Ferritin				
1 to 3	53	3089	1587	0.988
4 to 5	13	3081	1839	

DISCUSSION:

Raised serum ferritin is the main reason behind higher incidence of hypothyroidism and diabetes mellitus among patients with beta thalassemia, this effect was studied by Hantrakool S, et al. and it was concluded that Increased serum ferritin $> 2,500 \mu\text{g/dl}$ has been found to predict the development of cardiac function abnormalities but the predicting serum ferritin level for diabetes and hypothyroidism has not been determined [4].

American Society of Hematology reported a study on 50 thalassemia patients in which 42% of beta thalassemia cases who underwent early blood transfusion were hypothyroid as compared to normal individuals. The exact correlation could not be established in the study but raised serum ferritin level was suspected to be the reason for this raised incidence [5].

Journal of Pakistan Medical Association also published a study on understudy title in which correlation between hypothyroidism and beta thalassemia was positively noticed and early screening and treatment was recommended by Malik SA, et al.[6] on Indian and Bangladesh population the correlation between two diseases was studied and higher incidence was noticed in those with hemoglobinopathy requiring multiple blood transfusions. Author suggest more research work on the topic by using large cohort in order to establish the exact correlation and mechanism behind it [7,8].

CONCLUSION:

A statistically insignificant correlation between serum ferritin level and TSH level was observed among beta thalassemia patients.

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