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Research Article

**A CROSS-SECTIONAL RESEARCH TO ASSESS THE
CORRELATION BETWEEN LEVELS OF SERUM FERRITIN
AND LEVELS OF TSH SERUM IN THE PATIENTS OF MAJOR
 β -THALASSEMIA****Fatima Noor, Hina Tariq, Hira Nazneen**
University of Medical & Dental College Fsd**Abstract:**

Objective: To conclude the association in average serum ferritins levels along with average Levels of serum TSH levels in beta-thalassemia major patient is the purpose of the research.

Material and Methods: The mode of the research was cross-sectional and it was completed at Allied Hospital Faisalabad in the time frame of March to October 2017. The number of a beta thalassemia major patient enrolled for research were sixty-six as well as researcher judge the association in both the levels (average serum ferritins & average serum TSH).

Results:

The age of the entire patients was almost five to eleven years along with five to ten years average time span of blood transfusion, average serum TSH levels was in between (1.5257 to 6.0895 μ U/ml), average serum ferrite levels was in between (3086.015 to 3089.265 ng/dl). The researcher reported negative association in both the levels (average serum ferritins levels & average serum TSH levels) and that was statistically inconsiderable (p-value is equal to 0.911 and r-value is equal to "- 0.014").

Conclusion: The finding of the research disclosed that there is a negative association in both the levels (average serum ferritins levels & average serum TSH levels) and that was statistically inconsiderable. Findings of the research also presented negligible variations, noticed in both the levels (average serum ferritins & average serum TSH) of men along with women patients.

Keywords: Average serum Ferritins, Average Serum TSH, Beta-Thalassemia and Gene.

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INTRODUCTION:

Beta thalassemia is a genetic complication that is categorized by an insufficiency in the amalgamation of β -globin chains of Hemoglobin. Beta thalassemia is the reason by deviation in HBB gene on chromosome 11 as well as genetic in an autosomal unassertive design. That deviation causes the incapacity to blend fresh Beta chain consequence in entire complication in the development of Hemoglobin "A" [1]. This reduction leading to the advancement of microcytic anaemia that could be extremely dangerous and generally demanding extended period transfusion for patient survival. These transfusions change into an agent of the disease as they become the reason of iron overburden which in itself factor of a number of issues for the patient as well as chelation management is supplemental to redress the reactions of this overburden [2]. In Beta thalassemia major the changed gene presents over both alleles. Except for anaemia, the patient is too leaning towards other diverge difficulties. The additional iron discharge influences the structure, as well as thyroid gland operation, which subsequently advance to hypothyroidism that is generally subclinical anyhow, can also reveal other clinical indications [2]. It has been presented that these "endocrinopathies" happened between ten to twenty years age of life [3]. The commonness of the hypothyroidism related with Beta thalassemia major as well as its association with overburden iron has been a subject of disputation in the current years, with certain research presenting that there is a specific association in overburden iron and hypothyroidism and further research presenting nil association in overburden iron and hypothyroidism whatsoever alleged auxiliary factors for the presented hypothyroidism [4, 5]. Garadah TS *et al* in his research presented that increased serum TSH levels of Beta-thalassemia major patients associated absolutely along with serum ferritin levels ($P = 0.014$ & $R = 0.34$) denoting the connection in both [6]. Other research carried out at south Asian domain presented that expansion of hypothyroidism in patients of Beta thalassemia major alters with respect to zone, the standard of treatment and treatments conducts, appropriately inquiring the association in overburden iron and hypothyroidism [7].

To conclude the association in average serum ferritins levels along with average serum TSH levels in beta-thalassemia major patient is the purpose of the research. The finding of the research will lead us in the treatment of higher levels of serum TSH in blood transfusion β thalassemia major dependent patients if diagnosed association.

If the patient's haemoglobin is less than 7 gm/dl, microcytichyo chromic anaemia over appurtenant blood picture along with greater than seventy percent of HB on HBF electrophoresis along with hepatosplenomegaly marked patient as Beta thalassemia major. Both the levels (average serum ferritins & average serum TSH) measured in ng/dl and μ IU/ml respectively.

MATERIAL AND METHODS:

The mode of the research was cross-sectional and it was completed at Allied Hospital Faisalabad in the timeframe of March to October 2017. Researcher included in his research to all those Beta-thalassemia major patients in accordance with the definition of the operation, consecutive five-year blood transfusion patients, both gender having an age of six to fifteen years, entire those patients who obtaining one to three transfusion per month. Researcher excluded from his research to all those patients passing through bone marrow transplant, having an early record of radio or chemotherapy along with goitre and thyroxin intake, entire alcohol, and drug users, kidney, intense hepatitis as well as CVC complication patients and patients with record keeping of tumour. The researcher collected the data after taking approval from the institutional review panel along with written permission from the guardians of the patients. The number of a beta thalassemia major patient enrolled for research were sixty-six. The researcher collected the previous record of entire patient and drawn blood specimen formerly they experience their ongoing transfusion appointment, judged both the levels (average serum ferritins & average serum TSH) through chemiluminescence methodology on hormone analyzer Cobas e in chemical pathology department by Roche. Researcher give standardized management to Entire patients and noted details on Performa, conducted data assessment on SPSS software, assessed quantitative data (interval of blood transfusion, ferritin levels, age, TCH) along with calculation of average and SD for quantitative data such as interval of blood transfusion and age, regularity + percentage for qualitative data such as gender and measured Pearson association coefficient for both the levels (average serum ferritins & average serum TSH). Researcher managed consequences moderators such as (interval of blood transfusion, gender, age) through categorization, applied post categorization "T" test and assumed P value is less than or equal to 0.05 as important.

RESULTS:

The age of the entire patients was almost five to eleven years along with five to ten years average time span of blood transfusion, average serum TSH levels

was in between (1.5257 to 6.0895 μ IU/ml), average serum ferrite levels was in between (3086.015 to 3089.265 ng/dl). The Pearson association test presented that both the levels (average serum ferritins & average serum TSH) are inversely proportional to each other. The researcher reported negative association in both the levels (average serum ferritins levels & average serum TSH levels) and that was statistically inconsiderable (p-value is equal to 0.911 and r-value is equal to -0.014). In men and women, the levels of average serum TSH was between (1.601 to 5.499 μ IU/ml) and (1.345 to 6.229 μ IU/ml) respectively. The researcher conducted an association in the levels of average serum TSH for female and male and noted non-important (p = 0.956) variation between average TSH of males and females' patients. In men and women, the levels of average ferritin was between (1544.072 to 5048.808 ng/dl) and (1395.807 to 3998.713 ng/dl) respectively. The researcher conducted association in the levels of average serum ferritin for female and male and noted non-important (p = 0.155) variation between serum ferritin levels of males and females' patients moreover researcher divide the entire patients into two age categories. Age category of six to ten and eleven to fifteen years. The

average serum TSH in six to ten years age category was (3.688 \pm 2.152) μ IU/ml and (4.186 \pm 2.690) in eleven to fifteen years age category. Anyhow the variation between average TSH of dual age categories was statistically unimportant with P = 0.451. Similarly, the average serum ferritin levels in six to ten years age category was (3005.90 \pm 1587.091) ng/dl and (3343.06 \pm 1766.621) ng/dl in eleven to fifteen years age category. Anyhow the variation between the average serum ferritin levels of dual age categories was statistically unimportant with P = 0.474. Researcher divides the entire patients into two categories (five to ten and eleven to fifteen years) with respect to blood transfusion interval. The average TSH in five to ten years age category was (3.676 \pm 2.116) μ IU/ml and (4.350 \pm 2.897) μ IU/ml in eleven to fifteen years age category. The variation between average TSH of dual categories was statistically unimportant with P = 0.343. Similarly, the average serum ferritin levels in five to ten years category was (3089.09 \pm 1587.259) ng/dl and (3081.69 \pm 1839.551) ng/dl in eleven to fifteen years age category. The variation between the average serum ferritin levels of dual categories was statistically unimportant with P = 0.988.

Table – I: Comparison of Gender Distribution

| Gender | | Number | Mean Value | SD Value | P-Value |
|---------------------|--------|--------|------------|----------|---------|
| Mean TSH Serum TSH | Male | 43 | 3.820 | 2.219 | 0.956 |
| | Female | 23 | 3.787 | 2.442 | |
| Mean Ferritin Serum | Male | 43 | 3296.440 | 1752.368 | 0.155 |
| | Female | 23 | 2697.260 | 1301.453 | |

Table – II: Comparison of Age Group

| Age Group | | Number | Mean Value | SD Value | P-Value |
|---------------------|---------------|--------|------------|----------|---------|
| Mean TSH Serum TSH | 6 – 10 Years | 50 | 3.688 | 2.151 | 0.451 |
| | 11 – 15 Years | 16 | 4.186 | 2.690 | |
| Mean Ferritin Serum | 6 – 10 Years | 50 | 3005.900 | 1587.091 | 0.474 |
| | 11 – 15 Years | 16 | 3343.060 | 1766.621 | |

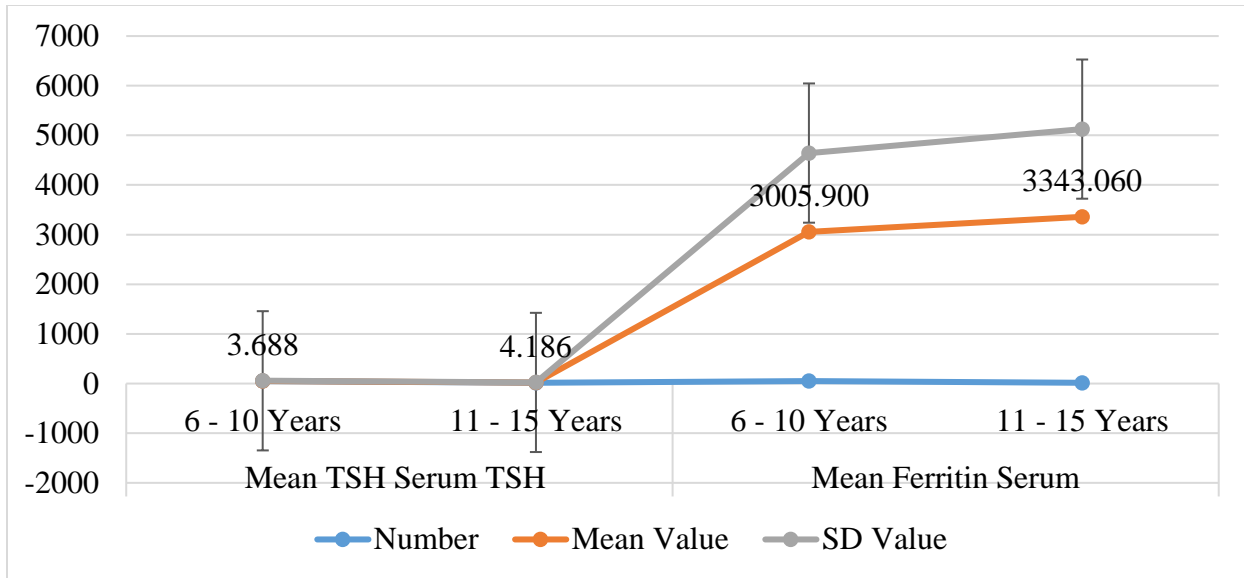


Table – III: Comparison of Blood Transfusion Comparison

| Blood Transfusion Duration | | Number | Mean Value | SD Value | P-Value |
|----------------------------|----------|--------|------------|----------|---------|
| Mean TSH Serum TSH | 5 to 10 | 53 | 3.676 | 2.116 | 0.343 |
| | 11 to 15 | 13 | 4.350 | 2.897 | |
| Mean Ferritin Serum | 5 to 10 | 53 | 3089.090 | 1587.259 | 0.988 |
| | 11 to 15 | 13 | 3081.690 | 1839.551 | |

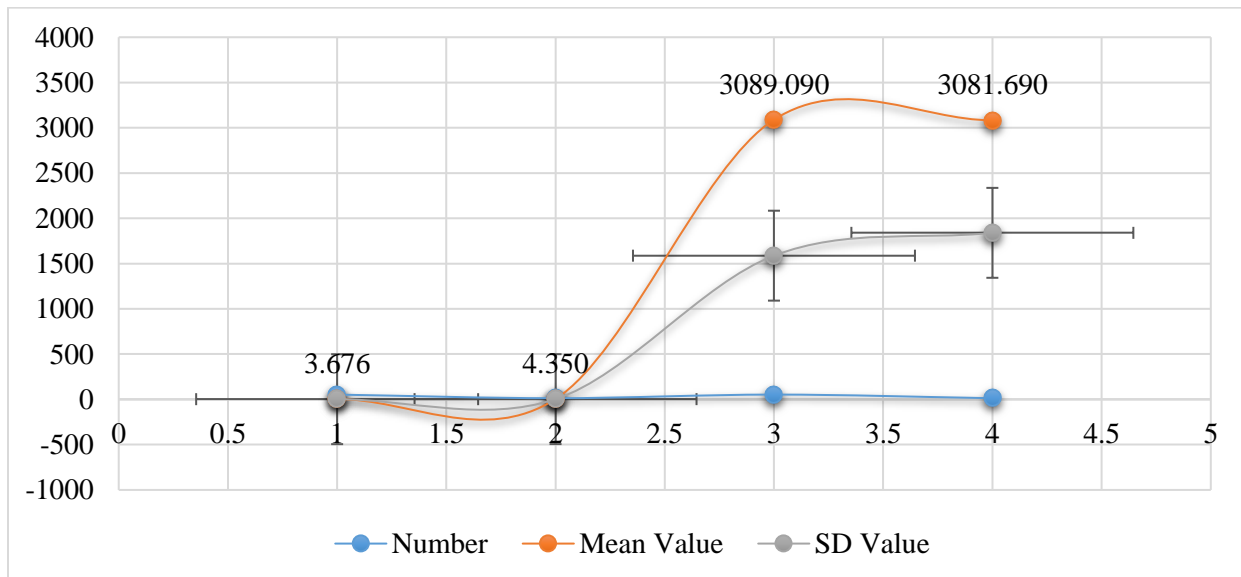
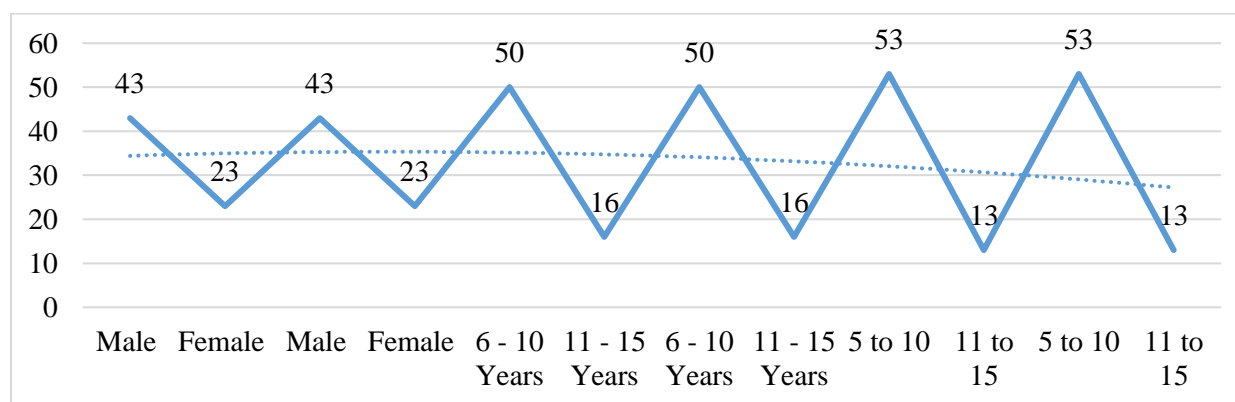


Table – IV: Sample Distribution

| Gender | | Number |
|---------------------|---------------|--------|
| Mean TSH Serum TSH | Male | 43 |
| | Female | 23 |
| Mean Ferritin Serum | Male | 43 |
| | Female | 23 |
| Mean TSH Serum TSH | 6 – 10 Years | 50 |
| | 11 – 15 Years | 16 |
| Mean Ferritin Serum | 6 – 10 Years | 50 |
| | 11 – 15 Years | 16 |
| Mean TSH Serum TSH | 5 to 10 | 53 |
| | 11 to 15 | 13 |
| Mean Ferritin Serum | 5 to 10 | 53 |
| | 11 to 15 | 13 |

**DISCUSSION:**

Thyroid hormones are imperative for appropriate growth, incompatibility as well as metabolism of the cells. Several researchers presented thyroid functioning complication in his research on patients of Beta-thalassemia. A broad spectrum of the pathogenic process might be involved. Tissues persistent hypoxia, as well as overburden iron, have a sharp poisonous impact over thyroid gland [8]. Huge centralization of labial plasma along with labial cell iron may advance to the development of free radical along with commodity of respondent oxygen species consequences in cell and organ injuries/wounds [9]. In serious overburden iron in patients of Beta thalassemia, the frontal pituitary might be injured as well as hormonal secretion controller (FSH, TSH and LH) might be disturbed [10]. The siderosis of parts (skeletal muscle, cardiac, liver, and kidney) may disturb the particular receptor that control/regulate thyroid hormone conduct and change T4 to the bioactive T3.

The age of the entire patients was almost five to eleven years, average serum TSH levels was in between (1.5257 to 6.0895 μ IU/ml), and average serum ferrite levels was in between (3086.015 to 3089.265 ng/dl). According to the research conducted by Malik and Karim et al presented (7.6 \pm 2.5) and (7.65 \pm 3.61) years of average age of Beta thalassemia patients respectively which is uniform/correlate able to our research [11]. In the current research, the number of male and female patients were sixty-five and thirty-five percent respectively. Karim et al presented the uniform percentage in his research. Solanki et al presented both the levels (average serum ferritins & average serum TSH) as (2927.40 \pm 783.39) and (7.14 \pm 9.04) respectively [12]. That is also correlated able with our research. The researcher reported negative association in both the levels (average serum ferritins levels & average serum TSH levels) and that was statistically inconsiderable (p-value is equal to 0.911 and r-value is equal to -0.014). As compared to our research Solanki and Farooq MS et al also presented

negative association in both the levels (average serum ferritins levels & average serum TSH levels) (p -value = 0.38) [13]. Contrary to our research, Garadah TS et al presented in his research that increased serum TSH levels of Beta thalassemia patients associated positively with serum ferritin levels ($p=0.014$, $r=0.34$) [14]. Eshragi et al also presented the association between the levels (average serum ferritins & TSH levels) that was not expressive ($p=0.548$). In current research in men and women, the levels of average serum TSH was between (1.601 to 5.499 $\mu\text{IU/ml}$) and (1.345 to 6.229 $\mu\text{IU/ml}$) respectively. The researcher conducted an association in the levels of average serum TSH for female and male and noted non-important ($p = 0.956$) variation between average TSH of males and females' patients. Farooq MS et al also presented the levels of average serum TSH was between (3.67 ± 0.69) $\mu\text{IU/ml}$ and (4.73 ± 1.20) $\mu\text{IU/ml}$ in males and females respectively with P value = 0.143. Results of this research are similar to our research. In men and women, the levels of average ferritin was between (1544.072 to 5048.808 ng/dl) and (1395.807 to 3998.713 ng/dl) respectively. The researcher conducted an association in the levels of average serum ferritin for female and male and noted non-important ($p = 0.155$) variation between serum ferritin levels of males and females' patients. Similar to our research Irshad et al also presented the levels of average serum ferritin for male and female as (2699 ± 858) and (2412 ± 750) [15].

CONCLUSION:

The finding of the research disclosed that there is a negative association in both the levels (average serum ferritins levels & average serum TSH levels) and that was statistically inconsiderable. Findings of the research also presented negligible variations, noticed in both the levels (average serum ferritins & average serum TSH) of men along with women patients.

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