Evaluation Inhibin B, FSH, and LH in Male with Thalassemia

Fatimah Kadhim Ibrahim AL- Mahdawi[1], Zaid Nabeel Elia[2], Hayder Abdulhafedh Kurji[3]

[1]Medical Laboratory Technology Department, Bilad Al-Rafidain University College.[2]Medical Laboratory Technology Department, Erbil Polytechnic University,[3]Faculty of Pharmacy, Bilad Al-Rafidain University College.

Abstract

Background : - Hypogonadism is the most frequently reported endocrine problem, affecting 70–80% of patients with thalassemia.**Aim of study: -**The current study is aimed to found correlation among inhibin-B,FSH, LH and testosteronein male with thalassemia. **Material and Subject:** The study carried out 40 healthyvolunteermale, age range between (18-30) years,and enrolled 40 patients with thalassemia major age range between 18-30 years. The concentrations serum inhibin-B was estimated by two-side enzyme-linked immunosorbent assays (ELISA), While FSH, and LH estimated by using Cobas e analyzers.**Results:** LH reduce significantly in thalassemia patients when compared with healthy individuals, while FSH and testosterone decrease significantly in thalassemia patients when compared with healthy. Inhibin B was reduced significantly in thalassemia patients when compared with healthy individuals.**Conclusion:**Infertility common in thalassemia patients, that correlation with decrease inhibin B.

Key Words: -*Inhibin B, FSH, LHand thalassemia*

Introduction

Beta-thalassemia is 'a genetic blood disorder characterized by absent or β globin chainsynthesis, resulting in decrease hemoglobin in red blood cells, reduced RBCs production and anemia[1].

The direct effect is an imbalance of the α and β globin chain synthesis that results in anemia from ineffective erythropoiesis and hemolysis[2].

The severity and prevalence of hypogonadism in thalassemia major differs among studies, dependent on the genotype of thalassemia and age group studied[3][4][5][6][7].Dysfunction of the sexual and infertility due to hypogonadism are well-recognized disorders of the hypothalamic pituitary gonadal axis[8].

Hypogonadism is the most frequently reported endocrine problem, affecting 70–80% of patients with thalassemia.Luteinizing hormone(LH) and Folliclestimulating hormone (FSH) are involved in the regulation and activation of thereproductive axis. Hormones produced via the gonadscontrolLH and FSH synthesis and excretion in afeedback loop [9]. Inhibin-B exhibit a physiological role in the feedback regulate of FSH secretion, and reflects FSH-stimulated Sertoli cell to be the function[10].Testicular functions can be evaluatedvia the basalhormonal FSH and LH[3]. Inhibin's are presentlypredictable asparacrine testicular controllers and have manyparacrine effects representing a promisingmarker for infertility in male[11].

Aim of study: -The current study is aimed to found correlation among inhibin-B,FSH, LH and testosteronein male with thalassemia.

Patients and Method

The study carried out 40 healthyvolunteermale, age range between 18-30 years,and enrolled 40 patients with thalassemia major age range between 18-30years. All patients received blood transfusion every 4−5 weeks.

The concentrations inhibin-B was estimated via two-side enzyme-linked immunosorbent assays (ELISA), While FSH, and LH estimated by using Cobas e analyzers.

All data are stated as mean ± stander error. The comparisons among groups were completedvia using t test.

The relationship between inhibin B, testosterone, FSH, and LH were determined using a pearson-correlationcoefficient. P less 0.05 was measured significant. The SPSS software for windows, version 20were achieved to all analyses.

Findings

Table 1 illustrated fertility parameters and inhibin B in male with thalassemia, the result showed LH within normal range (1.7-8.6mlU/ml) in thalassemia patients (3.37±0.62 mlU/ml) but reduce significantly when compared with healthy individuals (8.60±0.26 mlU/ml) p<0.000, while FSH and testosterone decrease than the normal range (0.5-4.3 ml/mL, and 3-10 ng/mL) respectively in thalassemia patients (3.07±0.31mlU/mL, and 2.20±0.28ng/mL)respectively, as well as decrease significantly when compared with healthy individuals (6.52±0.34mlU/ml, and 7.08±0.29ng/mL) respectively p<0.000.Inhibin B was within the normal rang (25-325pg/mL) in thalassemia patients (45.61±4.69pg/mL), and also reduce significantly when compared with healthy individuals (102.14±3.10/mL) respectively p<0.000.

Table:1Inhibin B, Testosterone, FSH, and LH

Parameters	**Normal range**	**Healthy Individuals (N=30)M±SE**	**Thalassemia Patients (N=60)M±SE**	**T-test P value**
Inhibin B	25-325pg/mL	102.14±3.10	45.61±4.69	<0.000
Testosterone	3-10ng/mL	7.08±0.29	2.20±0.28	<0.000
FSH	0.5-4.3mlU/mL	6.52±0.34	3.07±0.31	<0.000
LH	1.7-8.6 mlU/mL	8.60± 0.26	3.37± 0.62	<0.000
M Mean, SE Stander error, LH Luteinizing Hormone, FSF Follicular Stimulating Hormone				

Table illustrated relationship among the changes in inhibin B withtestosterone, FSH and LH, The mean inhibin-B was significantly positive correlation with mean testosterone, FSH and LH (r=0.497, p=0.001, r=0.333, p=0.036), and (r=0.447, p=0.004) respectivelyin thalassemia patients Table (2).

Table: 2 Correlation among Inhibin B, Testosterone, FSH, and LH

Inhibin B		
Parameters	**Pearson Correlation**	**P-value**
Testosterone	0.497	0.001
FSH	0.333	0.036
LH	0.447	0.004

Discussion

Physiological inhibin-B production via the adult testis needs a normal population of Sertoli cells, Spermatogenesis and FSH stimulation, to be existing andits displays an significant role in feedback hormone regulation between the gonads and the pituitary gland[12][11]. Current results show a significantpositive correlationamong inhibin-B, FSH and LH in malewiththalassemia. Bergada *et al.*2002report asignificant positive correlation ofmen inhibin-B with men LH[13]. These resultsthenfunding the inhibin-B has a role in the physiological regulation of LH and FSH excretion in maleand inhibin-B is thetesticular feedback signal for FSH[14].Testosterone andinhibin-B

and originate from different forms of cells in the testis [15].In our results we foundpositive correlation among inhibin-B and testosterone concentrations. that inhibin excretion from Sertoli cells is controlledvia interaction with germ cells and expression of a- and bB-subunit mRNA is maximal at stages of spermatogenesis which are greatlysensitive to FSH [16][17][18]. The mean values of inhibin B, LH, FSH and testosterone, in this study, there was highly significant decrease in thalassemia patients when compared with healthy individuals. Anearlier study displayed that histological investigation of the testicular tissue in patients with thalassemia provedvariable degrees offibrosis in testicular interstitial with small deeply pigmented undifferentiated seminiferous tubules, hyalinized, and an absence of Leydig cells[19]. Because of developments in the current medical care systems,males with β-thalassemia major who receive life-longblood transfusions now live longer. Therefore, thefertility and reproductive endocrinology requirements forsuch men are becoming more significant. The results ofthis study showed a significant decrease in the level ofpituitary and testicular hormones, and this may affordadditional strong evidence to suggest that iron overloadis at high risk of being related with reduced functionof gonad[20].

Serum Inhibin concentration have been stated useful to evaluate testicular function in many conditions [21]. In this study, they were lower than the healthy controls. This suggested that Sertoli cell function is abnormal in thalassemia patients and regular blood transfusions[22].

Serum testosterone levels,FSH and LH in patients with major weredifferent significantly when compared with healthy controls suggested that the hypothalamic–pituitary–gonadal axis is defect. In addition, serum testosterone levels in thalassemia patients were lesser than in controls. This suggested that testicular function is weakened[23].Other causes of these abnormalities may be related to the catabolic iron catalyzes the production of free radicals, resulting in oxidative stress in lipid membranes, lysosomes, mitochondria, DNA, proteins. This is maybe induced oxidative stress and direct effect in many organs, like, pituitary gland, hypothalamus, and female reproductive organs, other organs indirectly effected such as, pancreas and liver, and this will be contributing to the impaired the processes of metabolism of serum antioxidants and hormones [24].Oxidative stress modulates the age-related decline the infertility in patients suffer from β-thalassemia [25].

Conclusion

Infertility common in thalassemia patients, that correlation with decrease inhibin B.

Conflict of Interest: Non

Source of Findings: Self findings.

Ethical Clearance: Non

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