

Effect of Thyroxine Replacement on Sertoli Cell Function in Men With Hypothyroidism

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Thyroxine
Replacement on
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Aisha Rabel¹, Irfan Siddiqui² and Fatima Abid¹

ABSTRACT

Objective: The main objective of the study is to analyse the effect of thyroxine replacement on sertoli cell function in men with hypothyroidism.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Jinnah Postgraduate Medical Center Karachi During January 2019 till June 2019.

Materials and Methods: The data was collected from 40 male patients. Those participants who were not willing were not included in this study. Venous blood sample was collected for the analysis of baseline characters. The blood was drawn for the estimation of thyroid levels, FSH, LH, prolactin and testosterone.

Results: The data was collected from 50 patients. The mean age was 25.67±5.67 years. According to our analysis the total motile sperm at baseline was 29% and 80% at follow up. But total progressive motile sperms was 18% at baseline and 45% at follow up. The levels of FSH at baseline was 6.45mIU/mL and after follow up was 6.46 mIU/mL.

Conclusion: It is concluded that sertoli cell function is effected through hypothyroidism and sperm motility is also effected. We can say that hypothyroidism directly effect on the gonads function and sperms motality.

Key Words: Thyroxine, Sertoli Cell, Hypothyroidism

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INTRODUCTION

All things considered, for a long time, the effect of thyroid issues on male generation stayed questionable¹. Early investigations in the 1950's exhibited that testicles were basically free of thyroid chemical impacts. Consequently, the capability of thyroid chemical in the regulation of male regenerative capacity was not decided².

Nonetheless, in the previous twenty years, clinical investigations have exhibited that thyroid chemical assumes a significant part in testicular turn of events and capacity. It is currently settled that T3 manages the development and development of testis, controlling Sertoli cell and Leydig cell multiplication and separation during testicular improvement in rodents and other warm blooded animal species³.

¹. Department of Physiology, Jinnah Sindh Medical University, Karachi.

². Department of Medicine, Zaiuddin Hospital, Karachi.

Correspondence: Dr Aisha Rabel, Postgraduate Resident at Jinnah Postgraduate Medical Center Karachi.

Contact No: 03403952113

Email: mayesha2211@gmail.com

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The proficiency of spermatogenesis, reflected by every day sperm creation in adulthood, relates to the absolute number of utilitarian Sertoli cells set up during prepubertal life. Moreover, changes in thyroid chemical levels during early testis improvement have been appeared to influence testicular development and multiplication sometime down the road⁴.

The predominance of unmistakable hypothyroidism goes from 4.6% to 10.95%. Hypothyroidism is more uncommon in guys. Assessing gonadal capacity in hypothyroid patients is regularly interesting as the typical manifestations of hypogonadism like dormancy, diminished muscle strength, loss of body hair, discouraged disposition, and charisma are basic in essential hypothyroidism fundamentally⁵. Lab evaluation of hypogonadism and sexual brokenness includes the estimation of serum gonadotropins, serum testosterone, and semen examination. Be that as it may, there are issues with assessment of serum testosterone-like enormous intraindividual everyday inconstancy, diurnal variety (values will in general diminish during the early afternoon and night time frame), the precision and unwavering quality of the free testosterone examines, and helpless relationship with intra testicular testosterone⁶.

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capacity in hypothyroid patients is regularly precarious as the typical indications of hypogonadism like torpidity, diminished muscle strength, loss of body hair, discouraged mind-set, and moxie are normal in essential hypothyroidism fundamentally. Research facility appraisal of hypogonadism and sexual brokenness includes the estimation of serum gonadotropins, serum testosterone, and semen examination. Nonetheless, there are issues with assessment of serum testosterone-like immense intra singular everyday changeability, diurnal variety (values will in general diminish during the early afternoon and night time frame), the precision and dependability of the free testosterone examines, and helpless relationship with intra testicular testosterone⁷.

MATERIALS AND METHODS

This descriptive study was conducted in Jinnah Postgraduate Medical Center Karachi during January 2019 till June 2019. The data was collected from 40 male patients. Those participants who were not willing were not included in this study. Venous blood sample was collected for the analysis of baseline characters. The blood was drawn for the estimation of thyroid levels, FSH, LH, prolactin and testosterone. History and detailed examination was done for all participants. The data was collected through systematically designed questionnaire. The semen analysis was also done after 1 hour of collecting the semen. A *P* value of <0.05 was taken as significant. All data analysis was performed using SPSS version 19.0 (SPSS).

RESULTS

The data was collected from 50 patients. The mean age was 25.67±5.67 years. According to our analysis the total motile sperm at baseline was 29% and 80% at follow up. But total progressive motile sperms was 18% at baseline and 45% at follow up. The levels of FSH at baseline was 6.45mIU/mL and after follow up was 6.46 mIU/mL.

Table No.1: Changes in semen analysis and hormones at baseline and follow-up

Parameter	Baseline	Follow-up	<i>P</i>
Semen analysis			
Total motile sperm %	29	80	<0.01
Total progressive motile sperm %	18	45	<0.01
Total non-progressive motile sperm %	5	25	<0.01
Sperm count/ejaculate (million)	155	276	<0.01
Serum FSH (mIU/mL)	6.45	6.46	0.47
Serum LH (mIU/mL)	3.35	4.54	0.03
Serum prolactin (ng/mL)	10.765	8.09	<0.01
Serum testosterone (ng/dL)	151.525	421.56	<0.01
Serum TSH (mIU/mL)	162.45	2.37	<0.01

This is just a minor difference at the level of FSH at baseline and follow up. After treatment, all patients with abnormal sperm motility showed significant improvement except one with azoospermia. The level of TSH was 162.45mIU/mL at baseline and 2.37 mIU/mL after follow up. The *p*-value for TSH level was <0.01.

All the data is presented in table 01.

DISCUSSION

Thyroid disappointment in the pre-pubertal period is related with testicular extension just as modifications in sexual chemicals. Hypothyroidism started in outset may happen in association with macroorchidism without virilization, albeit the pathogenesis stays dubious⁷. The more extended the hypothyroidism perseveres, the more noteworthy is the level of harm to the testicles. When enough treated with thyroid chemical, nonetheless, young men with intrinsic hypothyroidism progress through adolescence typically and at the fitting time. Morphological changes might be seen in pubertal and grown-up men testicles with constant untreated hypothyroidism, albeit the outcomes are clashing. Griboff⁸, explored five hypothyroid patients and all showed ordinary sperm tallies, though different creators discovered morphological and spermatogenic modifications in testicular biopsies of prepubertal and grown-up hypothyroid patients. Hypothyroid prepubertal testis may give a prevalence of cylindrical compartment beginning stage of spermatogenesis and no expansion in the quantity of Leydig cells⁹. Grown-up testis, in any case, may introduce fibrosis and hyalinization of rounded dividers, fibroblastic multiplication, peritubular and interstitial fibrosis with inadequate Leydig cells, just as decrease of cylindrical distance across, interstitial edema and rounded basal film tenacity¹⁰.

In people, comparative investigations done work currently are heterogeneous, concerning the quantity of patients included, the manner in which semen examination was accounted for, and if the posttreatment impact was dissected. Studies on the impact of hypothyroidism on semen boundaries done work presently show an insignificant impact of hypothyroidism on semen volume, aside from one by Corrales et al., where a measurably critical contrast was found in the mean semen volume among patients and controls (2.7 ± 1.4 versus 3.7 ± 1.2). Sperm motility and sperm tally, the two significant sperm boundaries were differentially influenced in our investigation¹¹.

Sperm motility was the most influenced boundary in our examination not at all like that in the investigation by Corrales et al. where it was typical. Sperm check at standard was not influenced essentially like the investigations by Krassas et al. also, Nikoobakht et al Hypothyroidism can influence sperm motility through different instruments like expansion in the degrees of

responsive oxygen species (ROS) which adjust the sperm cell film, changes in the pH of the semen, irregular action of Na⁺ K⁺ ATPases, modified transmembranous transport of calcium in the sperm cell layer, mitochondrial number, articulation of mitochondrial qualities, and discharges from the prostate and original vesicle¹².

CONCLUSION

It is concluded that sertoli cell function is effected through hypothyroidism and sperm motility is also effected. We can say that hypothyroidism directly effect on the gonads function and sperms motality.

Author's Contribution:

Concept & Design of Study: Aisha Rabel
 Drafting: Irfan Siddiqui
 Data Analysis: Fatima Abid
 Revisiting Critically: Aisha Rabel, Irfan Siddiqui
 Final Approval of version: Aisha Rabel

Conflict of Interest: The study has no conflict of interest to declare by any author.

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