Effect of Levothyroxine Replacement on Testosterone, Lh, Fsh Levels in Men with Over Hypothyroidism

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Keywords: testosterone, hypothyroidism, levothyroxine

Abstract

Aim- to study the effect of hypothyroidism on testicular function, and the effect of post levothyroxine replacement on testicular function.

Methods and materials- this study was done in r&r hormone clinic in central part of india, the study was interventional. 21 naïve overtly hypothyroid male patient were taken in this study. The hormones essayed were free testosterone, lh, fsh, t3, t4, tsh before and after 4 months of levothyroxine replacement therapy. Additional adams questionnaire was included in this study to evaluate the prevalance of sexual disturbance in these patients. Proper consent was taken from the patients.

Inclusion criteria- newly diagnosed hypothyroid male 20—50 years

Exclusion criteria- History of diabetes mellitus; History of hypertension; History of testicular trauma;

History of hormonal replacement therapy; History of smoking, chronic alcoholism

Result- 50% of patients (10/21) at baseline had low free testosterone level value, mean value of 10-12% had low lh level value(3/21 patients), 88-90% has normal lh value(18/21 patients), fsh values of all the patients was normal, 60 % of patients has low adams score(12/21 patients).

After 4 months of therapy on restoration of euthyroidism 8 out of 10 (90%) hypogonadotropic patients the free testosterone level came normal (>300mg/dl), lh value of all the patients restored to normal values, 80% of the patients with low adams score showed improvement in their parameters.

Conclusion- there is a high prevalance of hypogonadism in hypothyroid male patients which seemed to be improved significantly after levothyroxine therapy.

Introduction

The prevalence of overt hypothyroidism ranges from 5% to 11%. Though Hypothyroidism is less common in males but thyroid hormone deficiency affects all organs of the body, including changes that alter growth hormone, glucocorticoids, and gonadal function. Primary hypothyroidism is associated with hypogonadotropic hypogonadism, which is reversible with thyroid hormone (levothyroxine) replacement therapy. Men with primary hypothyroidism have subnormal responses to (LH) or (GnRH) replacement versus significant response to (hCG). Free testosterone concentrations are decreased in men with primary hypothyroidism and thyroid hormone substitution normalizes free testosterone concentrations.

Discussion

Hypothyroidism, a common endocrine problem is known to cause significant disturbances in male reproductive function. The effect of hypothyroidism and its treatment on individual parameters like gonadotropins, prolactin, testosterone, INHB, and has not been well studied till now. In our study 50% of patients had low testosterone level at baseline, low testosterone level associated with hypothyroidism has been well documented in several studies with varying prevalances. The possible mechanisms by which hypothyroidism causes low total testosterone include reduced uptake of cholesterol into the steroidogenic cells for testosterone synthesis, inhibition of the enzymes converting progesterone to testosterone, decrease in serum sex hormone binding globulin level, hyperprolactinemia, increased rate of conversion of testosterone to estradiol, and decrease in the secretion of gonadotropins. Although pituitary imaging prolactin levels also have some role in hypogonadism associated with hypothyroidism but due to financial concerns these parameters were not taken in the study material.

In our study only 3 patients had low LH level at baseline while FSH level of all the patients was normal at baseline, semen analysis could not be done due to non consent of patients.

In our study after attainment of euthyroidism or after 4 months of replacement of levothyroxine therapy 80% of hypogonadic patients had their testosterone level normal, more than 80% of patients with low ADAMS score showed improvement in their parameters.

Conclusion

Thyroid hormone deficiency affects all tissues of the body, including multiple endocrine changes that alter growth hormone, corticotrophin, glucocorticoids, and gonadal function. Primary hypothyroidism is associated with hypogonadotropic hypogonadism, which is reversible with thyroid hormone replacement therapy. The same has been seen in our study also that after levothyroxine replacement there was

significant improvement in free testosterone level, significant improvement in ADAMS score, although predominance of hypogondotropic hypogonadism was not that significant but still some degree of relevance was observed.

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