

Study of testosterone levels in male type 2 diabetes mellitus patients

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Diabetes Mellitus has now reached an epidemic population in India. Around 50.8 million people in India are suffering from type 2 diabetes. This constitutes the world's largest diabetes population, and hence India is also labeled the "World Capital of Diabetes".

In developing countries, unfortunately by the time type 2 diabetes is recognized, diagnosis confers neither predictive nor protective benefit because most men have often developed advanced micro and macro vascular complications leading to exponential rise in morbidity.

A condition seen associated commonly with diabetes is secondary hypogonadism. However, it is unclear whether hypogonadism contributes to type II diabetes, or vice versa. The common thread linking these two diseases could be Insulin Resistance which is an important feature of type 2 diabetes. A significant inverse relationship exists between testosterone levels and insulin concentrations in healthy men.

This research is an effort to come up with a simple blood test to measure the testosterone levels in type 2 diabetics as a significantly low testosterone level can serve as a prognostic indicator of the severity of diabetes mellitus type 2.

Material and Methods

This was a cross-sectional study in which 60 patients were enrolled for the study and divided into two groups, diabetics and the controls. Appropriate clinical history and ADAM questionnaire was filled and Serum testosterone levels were measured. All the

data obtained was recorded systematically & analyzed using standardized statistical softwares and Students' unpaired t-test and chi-square tests were applied.

Results

Low testosterone values were seen in 53% diabetic men and 7% of non-diabetic men.

There was a significant negative correlation between age and total testosterone levels ($p = 0.042$).

Also, association between androgen deficiency and multiple risk factors, including obesity, family history of diabetes mellitus, ageing, and autonomic neuropathy was observed.

Conclusions

There exists a high prevalence of symptomatic hypogonadism in men with type 2 diabetes. An age-related fall in total testosterone levels both in diabetic and non-diabetic men but the prevalence of hypogonadism was significantly more in type 2 diabetes mellitus patients compared to their normal counterparts suggesting that metabolic derangements in type 2 diabetes mellitus have a strong association with low testosterone levels seen in such patients.

Hence, the development of diabetes mellitus can be predicted by a simple blood test measuring testosterone levels, although, clinical diagnosis of hypogonadism in diabetics solely rests on history and examination. Serum testosterone levels can serve as a simple

indicator to screen the diabetic patients for an early aggressive treatment modality to limit the inevitable complications of the disease. Testosterone replacement therapy as well as lifestyle modifications with regard to diet and exercise may synergistically slow or halt the

progression of type 2 diabetes, cardiovascular disease, and erectile dysfunction. However, larger studies are required to establish the benefit of testosterone replacement therapy on quality of life and the diabetic state in men.