

ENDOGENOUS SEX HORMONES LEVELS AND THEIR ASSOCIATION WITH TYPE 2 DIABETES IN NORTH INDIAN MEN AND WOMEN

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ABSTRACT

Objective

To study endogenous sex hormones serum levels and their effects in Indian men and women having Type 2 Diabetes

Research Design and Methods

For the analyses, (n=200) subjects including (n=94) males and (n=106) females, out of which 100 diagnosed cases and 100 age and sex matched healthy controls were studied. Only diagnosed cases of diabetes type 2 (50 men and 50 women) aged 45–75 years undergoing glucose profile testing in outdoor clinics in the hospital PGIMS, Rohtak (2011–2013) were included following a detailed protocol. Patients with acute complications like coma and acidosis, pregnant women, postmenopausal women on hormone replacement therapy, use of steroids since past six months, type 1 diabetes were excluded. Early morning fasting samples were collected and serum analysed for testosterone, estrogen, fasting blood glucose and HbA1c. Serum testosterone levels [normal= males 20-39 years: 241–827 ng/dL, 40-89 years: 141-703 ng/dL; Adult Females:>19 years:<77ng/dL] were measured using direct chemiluminescent technology on ADVIA Centaur autoanalyser. Serum estrogen (normal in males- 10-36 pg/ml, females-Premenopausal:13-191 pg/ml, Postmenopausal:11-65 pg/ml) and HbA1c levels (normal=4-5.6% in normal people, <6.5% -target for control in diabetics) were measured on Autoanalyser via Immunoassay Kits. The results were analysed and compared.

Results

Overall analysis showed that diabetic men had low testosterone values (287.50±61.09) ng/dL as compared to controls (409.38 ±113.23) ng/dL (p<0.001) and raised HbA1c, whereas diabetic women had raised testosterone (52.35 ± 41.09) ng/dL values (p<0.001) and raised HbA1c as compared to controls (25.00±16.99) ng/dL (p<0.001). Diabetic Women had mean estradiol levels (47.00 ±53.36) pg/ml lower as compared to control females (69.31±57.51) pg/ml, (p <0.05), also they negatively correlated with HbA1c. Men showed no significant difference in estradiol levels in diseased and controls and showed no correlation between estradiol and HbA1c levels.

Conclusion

In North India -Diabetes type 2 is associated with Low Testosterone levels in Males, low estradiol and High

Testosterone levels in Females, which in turn is associated with poor glycemic control in Diabetes type 2. Such associations suggest possible clinical applications of sex hormone biomarkers in potentially adding prospective risk information. More prospective studies are needed to better define risk levels.

KEYWORDS: Coma and Acidosis, Pregnant Women, Postmenopausal Women on Hormone Replacement Therapy, Use of Steroids