

Sex steroids levels and body composition in male patients with Type 1 Diabetes Mellitus

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OBJECTIVES

Association between diabetes mellitus (DM) and low testosterone levels was suggested a long time ago. While, it is now widely accepted that men with type 2 DM (T2DM) tend to have lower testosterone levels compared with general population, data are limited regarding testosterone levels in T1DM. Additionally the association of testosterone levels with the body composition in patients with T1DM has not been systematically studied. The objective of the present study was to evaluate serum sex steroids levels in patients with T1DM and their effect on body composition

METHODS

- We studied:
 - 36 male patients with T1DM (Group D) (age: 35.3±11.66, years) with diabetes duration >5 years
 - 35 healthy control (Group C) matched for age, sex and body mass index (BMI)
- In both groups, we measured:
 - waist circumference (WC)
 - glycated hemoglobin (HbA1c)
 - total testosterone (TT)
 - sex hormone-binding globulin (SHBG)
 - luteinizing hormone (LH)
 - follicle-stimulating hormone (FSH)
 - insulin-like growth factor 1 (IGF-1)
 - albumin
- Calculated free testosterone (cFT) was estimated by standard formulas
- Body composition was determined by DXA. Central abdominal fat (CAF) was calculated at a subregion of a 4cm slice at the top of the iliac crest

(Hologic Discovery QDR Series Densitometer, Hologic Inc., Bedford, MA)

RESULTS

	D	C	p-value
Number	36	35	
Age (y)	35.3±11.66	35.1±10.8	0.410
Duration of DM (y)	16.8±10.5	-	
BMI (kg/m ²)	25.8±3.44	25.2±3.2	0.370
WC (cm)	94.5±9.6	92.9±8.7	0.240

	D	C	p-value
HbA1c (%)	8.2±1.1	5.1±0.4	0.0007
TT (nmol/L)	19.52±7.46	21.82±6.12	0.062
cFT (nmol/L)	0.608±0.136	0.812±0.119	0.057
SHBG (nmol/L)	39.57±7.5	37.32±6.9	0.043
LH (mIU/ml)	5.6±2.8	4.9±2.4	0.171
FSH (mIU/ml)	4.4±3.9	3.6±2.1	0.082
IGF-1 (ng/ml)	144.7±30.1	180.2±27.1	0.031
Albumin (g/dl)	4.4±0.5	4.6±0.4	0.072

	D	C	p-value
Total body fat (g)	17568.6±7991.5	16967.5±7002.1	0.072
Total body fat (%)	20.8±6.4	20.1±5.6	0.080
CAF (g)	1216.2±792	1192±734.2	0.069
CAF (%)	25.5±9.0	24.9±8.7	0.061

- Patients in group D had significantly higher SHBG (p=0.043) and significantly lower IGF-1 compared to group C (p=0.031)
- TT levels were similar in both groups
- Lower cFT levels were observed in group D compared to C but they did not reach clinical significance (p=0.057)
- Total fat and CAF were similar in both groups

In Group D:

- 2/36 (5.6%) patients had TT levels below the normal range after adjustment for age and BMI
- No correlation was observed between TT and FT with the duration of diabetes, but a negative correlation was observed with HbA1c without reaching clinical significance (p = 0,054 and p = 0,059)
- WC was negatively correlated to TT levels (r = -0,71, p = 0,041)
- CAF was negatively correlated to TT and FT levels (r= -0.73, p=0.029 and r=-0.79, p=0.034)

CONCLUSIONS

Male patients with T1DM have higher SHBG levels and a tendency to lower free testosterone levels compared to healthy males. Lower free testosterone levels in this group of patients associated with higher waist circumference and central abdominal adiposity.

References

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