Improvement of metabolic syndrome in 300 hypogonadal men treated with testosterone undecanoate injections: observational 6-year-data from a registry study

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Background: Very few long-term studies on testosterone replacement therapy (TRT) allow investigating the sustainability of its effects. Our registry study follows unselected hypogonadal patients presenting to a urological office since 2004. Here we report data of a 6-year follow-up.

Methods: Cumulative, prospective, registry study of 300 men (mean age: 57.7±6.8 years) with testosterone levels ≤12.1 nmol/L. All men received parenteral testosterone undecanoate 1000 mg/12 weeks following an initial 6-week-interval.

Results: Total cholesterol (mg/dl) decreased from 279.72±40.85 to 189.61±8.93 ($p<0.0001$). Model-adjusted mean change from baseline was -91.55±2.11 mg/dl.

HDL (mg/dl) increased slightly from 56.47±17.85 to 61.06±18.06 ($p<0.0001$). Mean change from baseline was +9.97±0.37 mg/dl.

LDL (mg/dl) decreased from 163.22±40.87 to 126.02±33.4 ($p<0.0001$). Mean change from baseline was -24.81±1.51 mg/dl.

Triglycerides (mg/dl) decreased from 272.94±50.8 to 188±8.3 ($p<0.0001$). Mean change from baseline was -84.87±2.51 mg/dl.

The ratio of total cholesterol:HDL decreased from 5.37±1.56 to 3.39±1.03 ($p<0.0001$).

All changes in lipids were statistically significant during the first two years ($p<0.0001$) and remained stable thereafter.

Fasting glucose (mg/dl) decreased from 102.93±13.55 to 95.98±2.38 ($p<0.0001$), HbA_{1c} from 6.94±1.48 to 6.05±0.59% ($p<0.0001$). Mean change from baseline was -1.47±0.08%.

Systolic blood pressure (BP; mmHg) decreased from 153.06±17.37 to 137.07±9.19, diastolic BP from 92.58±11.22 to 78.59±6.61. Mean reductions were -17.85±0.58 and -14.88±1.54 mmHg, respectively. Changes in BP were statistically significant during the first two years ($p<0.0001$) and remained stable thereafter.

Changes over time compared to baseline in total cholesterol, LDL, triglycerides, fasting glucose, HbA_{1c} and BP were significantly correlated with changes in waist circumference and weight. Changes in HDL were correlated to changes in testosterone.

Conclusions: TRT produced improvement of all elements of the metabolic syndrome. Long-term TRT results in sustainable reduction of cardiometabolic risk factors in hypogonadal men.