

## **Treatment of patients with a late diagnosis of Klinefelter's syndrome with testosterone undecanoate for a duration of up to 5 years**

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**Introduction:** Klinefelter's Syndrome (KS) is markedly underdiagnosed with less than 10% of cases identified by puberty and less than 20% ever diagnosed during life. In the present study we describe a cohort of men suffering from KS, diagnosed at advanced age. The majority of the patients had been referred by an orthopedic surgeon to be checked for hypogonadism after a diagnosis of osteoporosis.

**Methods:** Open-label, single-center, cumulative, registry study of 22 middle-aged men with testosterone levels between 2.1 and 3.5 ng/mL (mean:  $3.08 \pm 0.46$ ). 21 men were studied for at least 2 years, 18 for 3 years, 11 for 4 and 8 for at least 5 years. They received parenteral testosterone undecanoate 1000 mg/12 weeks after an initial interval of 6 weeks.

**Results:** After 5 years the following changes were observed: Testosterone (ng/mL) increased from 3.08 to 4.86 ng/mL ( $p < 0.0001$ ). Body weight (kg) decreased from 105.05 to 90.88 ( $p < 0.0001$  vs baseline). Waist circumference (cm) declined from 104.32 to 96.50 ( $p < 0.0001$  vs baseline). The mean T-score increased from -2.91 (min -3.90, max -2.60) to -1.50 ( $p < 0.0001$  vs baseline). Glucose levels remained unchanged with mean levels below 100 mg/dL at all time-points. Total cholesterol decreased from 240.95 to 177.75 ( $p < 0.0001$ ), LDL from 124.09 to 64.13 ( $p < 0.0001$ ) and triglycerides from 235.09 to 180.75 ( $p < 0.0001$ ). HDL did not change significantly.

**Conclusions:** Raising serum testosterone to normal in patients with a late diagnosis of Klinefelter's syndrome improved body composition including bone mineral density. Other features of the metabolic syndrome were also improved.