Testosterone release rate and duration of action of testosterone pellet implants

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Summary

OBJECTIVE Testosterone pellets are a highly effective subdermal depot administered at regular intervals with the timing individualized depending upon return of the patient's characteristic androgen deficiency symptoms. Yet the *in vivo* testosterone release rate and effective duration of action of these pellets has been little studied systematically.

DESIGN Analysis of prospectively collected data from three randomized controlled clinical trials. Collection of extruded pellets.

PATIENTS Androgen-deficient men (n = 136) undergoing long-term androgen replacement therapy with a standard dose (800 mg) of testosterone pellets implanted subdermally at intervals from 5 to 7 months.

MEASUREMENTS Testosterone release rate of pellets, consisting of pure crystalline testosterone without excipients, is estimated by measuring the dry weight lost by pellets (n = 179) over their time *in situ*. The effective duration of the standard regimen, and the influence of extrusion and patient or procedural characteristics on it, was estimated by timing of return for re-implantation due to recurrence of the patient's familiar androgen deficiency symptoms.

RESULTS The loss of dry weight of intact (n = 112) pellets was strongly correlated with time *in situ* (r^2 = 0·969) providing an estimate of daily testosterone release rate per 200 mg pellet of 1·34 ± 0·02 mg/pellet/day (95% CI 1·30–1·37 mg/day) for the first 3 months. After 756 implantations of the standard dose, men return for re-implantation at 5·8 calendar months following no or only a single pellet extrusion, but the time to return was significantly shorter after multiple extrusions. No patient or procedural features influenced the timing of return. Among men with primary hypogonadism, increases in plasma LH and FSH were more sensitive than plasma total or free testosterone to changes in testosterone delivery following an extrusion.

CONCLUSION Testosterone pellet implants release testosterone at a steady rate of 1·3 mg/200 mg implant/day (95% CI). The duration of action is about 6 months in an uncomplicated cycle with timing of return shortened by extrusions only in the 3·6% of procedures followed by multiple extrusions. No other patient or procedural features influenced duration of action. Among men with an intact hypothalamo-pituitary unit, plasma gonadotropins are more sensitive than blood total or free testosterone to reduced testosterone delivery following an extrusion.

Jay's Comments: Pellet extrusion (the pellets comes out the hole that put it in) never happens if you put in a stitch. Both Testopel and Sottopelle teach NO stitch needed. Stupid