

## AB029. The beneficial effects of pulsatile gonadotropin-releasing hormone pumps in the treatment of adult male idiopathic hypogonadotropic hypogonadism

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**Background:** To explore the efficacy of pulsatile gonadotropin-releasing hormone (GnRH) on patients with idiopathic hypogonadotropic hypogonadism (IHH) via a microinfusion pump.

**Methods:** Fifty-four adult male patients who were diagnosed as having IHH in our hospital between August 1, 2013 and August 31, 2017 were included in the present study. All patients were treated with pulsatile GnRH pumps. Patient clinical parameters included secondary sex characteristics, morphology and size of external genitalia, and sex hormone concentrations. Fertility and sexual function were observed, evaluated, and recorded before and at 3, 6, and 12 months of treatment, and any adverse events during treatment were also recorded.

**Results:** The mean follow-up time was 15.9 (range 2–40) months. Twenty-six patients treated with pulsatile GnRH infusion were followed over 2 years, 41 cases were followed over 1 year, 45 cases were followed over one-half year, 5 cases were followed for 3 months to one-half year, and 4 cases were followed for under 3 months. Before treatment, the mean testicular volume of male IHH patients was  $3.19 \pm 1.66$  mL, the luteinizing hormone (LH) level was  $0.67 \pm 0.63$  U/L, follicle-stimulating hormone (FSH) was  $1.27 \pm 0.88$  U/L, T was  $0.50 \pm 0.53$  ng/mL, resting penile length was  $3.54 \pm 0.92$  cm, penile pull length was  $5.73 \pm 1.27$  cm and penile circumference was  $5.28 \pm 1.14$  cm. After more than one-half year of continuous treatment, the mean testicular volume of 45 cases of male IHH patients was  $6.22 \pm 1.85$  mL, LH was  $6.72 \pm 5.35$  U/L, FSH was  $5.48 \pm 3.23$  U/L, T was  $2.36 \pm 1.37$  ng/mL, resting penile length was  $4.77 \pm 0.68$  cm, penile pull length was

$7.87 \pm 1.01$  cm and penile circumference was  $7.55 \pm 1.09$  cm; all of these were significantly increased relative to the same parameters before treatment ( $P < 0.01$ ). After 1 year of treatment, the mean testicular volume of 41 cases of male IHH patients was  $8.78 \pm 2.24$  mL, LH was  $6.56 \pm 3.89$  U/L, FSH was  $5.04 \pm 2.49$  U/L, T was  $3.57 \pm 1.08$  ng/mL, resting penile length was  $5.70 \pm 0.69$  cm, penile pull length was  $9.44 \pm 1.24$  cm, and the penile circumference was  $8.74 \pm 1.03$  cm; all of these were significantly increased compared with the same parameters prior to treatment ( $P < 0.01$ ). External genitalia and T concentrations were further improved compared with treatment at one-half year of treatment ( $P < 0.05$ ). After 2 years of treatment, the mean testicular volume of 26 cases of male IHH patients was  $9.73 \pm 1.93$  mL, LH was  $6.12 \pm 3.22$  U/L, FSH was  $4.80 \pm 2.05$  U/L, T was  $3.81 \pm 0.68$  ng/mL, the resting penile length was  $6.08 \pm 0.52$  cm, penile pull length was  $9.63 \pm 1.07$  cm and the penile circumference was  $8.78 \pm 0.87$  cm; all of these were significantly increased relative to the same parameters before treatment ( $P < 0.01$ ). External genitalia and T concentrations were further improved compared with one-half year of treatment ( $P < 0.05$ ). T was also further dramatically improved compared with T concentrations at 1 year of treatment. All 45 patients who were treated for at least 6 months produced ejaculates. Thirty-four of the 45 patients who had over one-half year of treatment successfully collected their semen by masturbation, and the results showed that there were spermatozoa in 27 patients. Four married patients who were treated for over 1 year impregnated their wives. Only a few minor adverse events were found, and most patients showed very good adherence to treatment.

**Conclusions:** GnRH pulsatile pumps for the treatment of adult male IHH constitute a safe and effective strategy with ideal long-term beneficial effects. It is suggested that the GnRH pulsatile pump is the preferred treatment for IHH patients.

**Keywords:** Idiopathic hypogonadotropic hypogonadism (IHH); gonadotropin-releasing hormone (GnRH); Kallmann syndrome; pulsatile pump

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