Growth Hormone: analysis of actual and ideal body weight prescribing

# Aims

Growth hormone (GH) treatment in children is usually prescribed using actual (total) body weight (TBW). In obese and overweight children this results in inappropriately high doses as GH is primarily retained in the intravascular compartment, the volume of which is relatively constant in obesity. In these patients dosing using body surface area (BSA), ideal body weight (IBW), or lean body weight (LBW) may be more appropriate

# Methods

Retrospective audit of GH prescribing from a tertiary paediatric centre was undertaken. BSA was calculated from the Boyd formula and IBW and LBW were calculated using published validated formulae. Intended dose (mg/kg/week) was calculated for children where TBW ≥ IBW. Costs were extracted from paediatric national prescribing formulary.

# Results

468 patients (185 female and 283 male) were identified, with 462 (98.7%, 183 females and 279 males) with complete data. TBW was greater than IBW in 265 (57.4%), and BMI SDS ≥1.75 in 81 patients (17.5%). Comparing BMI SDS 1.01-1.74 and BMI SDS ≥1.75 patients using current dosing (mg/kg), change in height SDS was 0.43 v 0.62 respectively (p=0.55), change in IGF-1 SDS was 2.0 v 2.6 (p=0.14). Median dose of growth hormone per patient would be significantly reduced in those with either TBW>IBW, or BSA>1.75, if dose was calculated by LBW or IBW, saving £69,658-£448,821 annually.

# Conclusion

Overweight children get much larger doses of growth hormone, according to IBW or LBW, than non-obese children. Studies now need to be undertaken to determine the most appropriate measure for the calculation of GH doses in overweight and obese children.

**Word count 255**