Comparative analysis of two models for adult height prediction and predicted age at menarche for girls with idiopathic central precocious puberty treated with GnRH Analog

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Introduction: Idiopathic Central Precocious Puberty (ICPP) in girls happens when pubertal signs are present before 8 years of age without an organic cause. Lower predicted adult height (AH) and psychosocial inadequacy are parameters used to indicate treatment with gonadotropin-releasing hormone analogs (GnRHa).

Aim: To compare methods for AH prediction and to validate a tool for predicting age at menarche (AAM) in ICPP girls.

Methods: Predicted AH of 48 ICPP girls treated with GnRHa was calculated by Bayley- Pinneau (BP) tables at diagnosis and at the end of treatment (EOT) and compared with a mathematical model (MM) created by Giabicani et al. Predicted AH was compared with AH and target height (TH). Predicted AAM by MM was compared with actual AAM. Student’s t-test and linear regression models were used.

Results: Using BP, the mean predicted AH (MPAH) was 152.77 ± 7.9 cm at diagnosis and 158.78 ± 6.76 cm at EOT. AH was 158.4 ± 6.2 cm, TH was 157.9 ± 6.1 cm and mean AAM was 11.9 ± 0.72 years. Using the MM at diagnosis, the MPAH was 160.04 ± 4.95 cm while the mean AM was 10.14 ± 0.45 years. We found a weak correlation between BP at diagnosis and AH (0.48; \(p<0.001\)), a moderate correlation between MM and AH (0.58; \(p=0.001\)) and a strong correlation between BP at EOT and AH (0.74; \(p<0.001\)).

Conclusion: At diagnosis of CPP, the MM is more accurate for AH prediction than BP and can be used to predict AAM, helping in clinical decision.

Keywords: Adult height; Central precocious puberty; Bayley Pinneau; GnRH analog.