

# Testosterone Therapy Improves the first year Height Velocity in Adolescent Boys with Constitutional Delay of Growth and Puberty

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## Background

- Constitutional Delay of Growth and Puberty (CDGP) is a transient state of hypogonadotropic hypogonadism associated with prolongation of childhood phase of growth, delayed bone age and pubertal delay<sup>1</sup>.
- CDGP can cause significant psychological stress and anxiety in adolescent boys. Although testosterone usage in this group has not been shown to affect the final adult height<sup>2</sup>, the effect on the first year height velocity is not widely reported.

## Objective and Hypothesis

To determine whether testosterone treatment improves the first year height velocity in boys with CDGP when compared with height velocity in boys with CDGP who go through puberty spontaneously.

## Methods

- Retrospective growth data from 23 adolescent boys with CDGP was analysed.
- CDGP was diagnosed based on medical and family history, examination, and auxology and exclusion of pathology by appropriate investigations.
- Ten out of 23 boys received monthly testosterone injections for 3-6 months in total. ANOVA was used to compare the height velocity between boys who received testosterone and those who proceeded through puberty spontaneously.

## Results

Table: Auxological and anthropometrical parameters between the two groups (Treatment and no treatment with testosterone):

|   | Treatment with Testosterone | No treatment   | P-value |
|---|-----------------------------|----------------|---------|
| Mean age at treatment initiation                                | 14.4(±0.44)                 | Not applicable |         |
| Mean (SD) height SD Score                                       | -2.1(±0.64)                 | -1.9(±0.84)    | 0.57    |
| Mean (SD) bone age (years)                                      | 11(±1.6)                    | 12.1(±1.6)     | 0.13    |
| Mean (range) testicular volume (ml)                             | 4.5(3.6-5.4)                | 4.7(4-5.4)     | 0.6     |
| Mean (SD) height velocity (cm/year) at 12 months of follow-up   | 8.4(±1.7)                   | 6.1(±2.1)      | 0.01    |
| Mean (SD) predicted adult height (cm) at 12 months of follow-up | 164.26(±3.7)                | 167.44(±6.0)   | 0.15    |
| Mean (SD) predicted adult height SD Score                       | -0.8(±1.15)                 | -0.86(±0.71)   | 0.86    |

- The mean (±SD) height velocity one year after treatment was 8.4cm/year (±1.7) when compared to 6.1cm/year (±2.1) in the patients who did not receive treatment [p=0.01]
- There was no significant difference in the final predicted height between the 2 groups

## Conclusion

Testosterone therapy can significantly improve the first year height velocity in boys with CDGP, without influencing the final predicted height, leading to a potential reduction in anxiety and psychological distress that affects this group of children.

## References

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