

# Evaluation of 293 Danish Girls with Tall Stature

## Diagnostic Characteristics and Effects of Oral Administration of 17-β Estradiol

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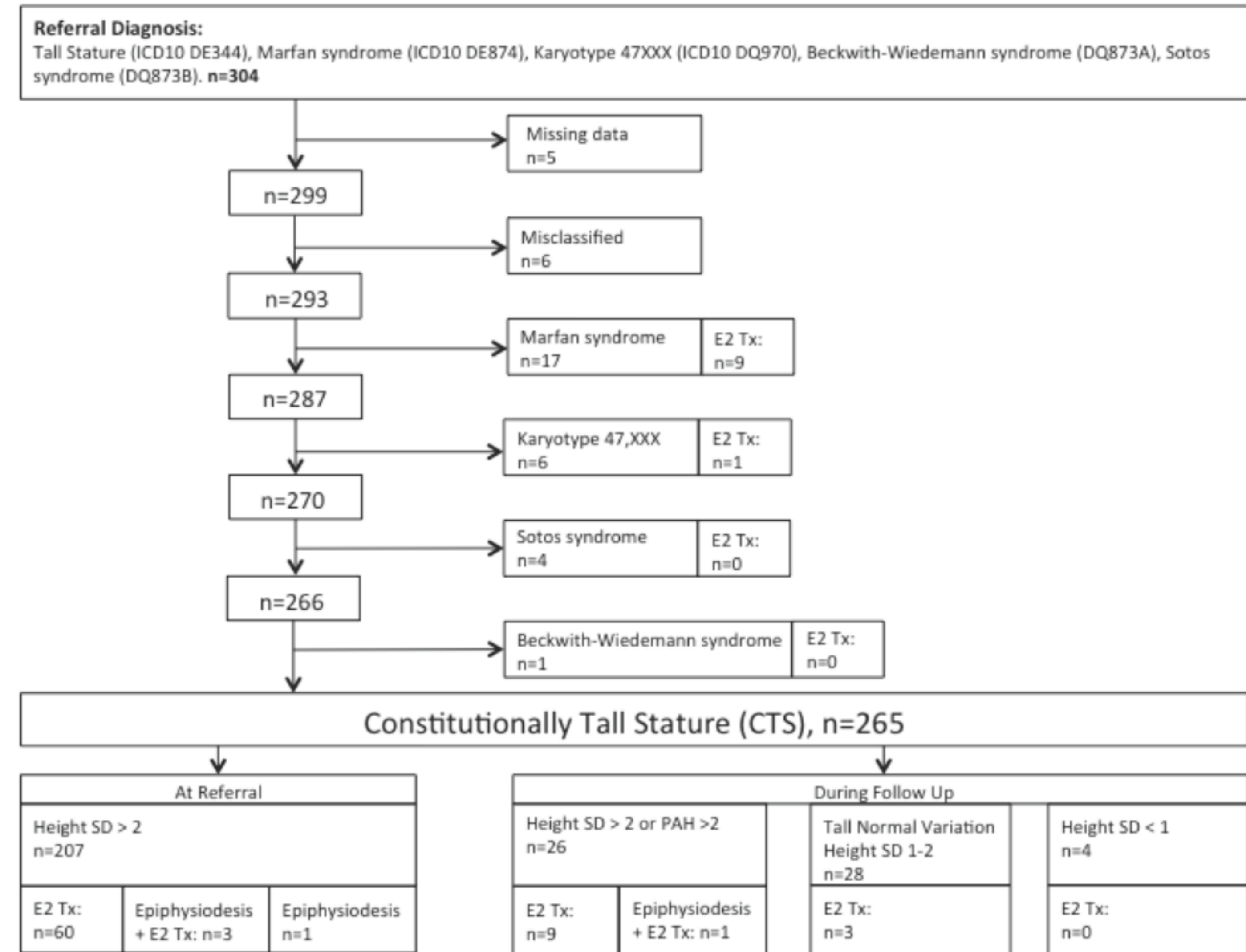
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### Introduction and objectives

Tall stature in girls can be associated with frequent teasing, hurtful remarks about their height and psychosocial distress. Therefore, height reduction by estrogen therapy has been commonly used for decades, but remains controversial. Possible side effects of the most common used treatment, synthetic ethinyl estradiol therapy, like reduced fertility (1,2) thromboembolic events (3) and cancer risk (4) needs to be balanced against a possible beneficial effect on adult height. In our centre natural 17-β Estradiol (E2), is used in order to initiate or ensure rapid progression of puberty, and reduce final height (FH). The aim for this study is to evaluate the phenotypic characteristics in a large cohort of 304 girls referred due to tall stature, and to evaluate the effect of oral E2 on final adult height.

### Methods

A retrospective observational study of 304 tall statured girls referred between 1993 and 2013 in a single tertiary centre. We included 207 girls whom fulfilled the criteria height > 2 SD, after exclusions due to misclassification and overgrowth syndromes. Of these girls, 60 were treated with E2 for an average duration of 1.7 (1.2-2.5) years and 26 were followed until final height. Auxology, adult height prediction (AHP), reproductive hormones and attained final height were evaluated.



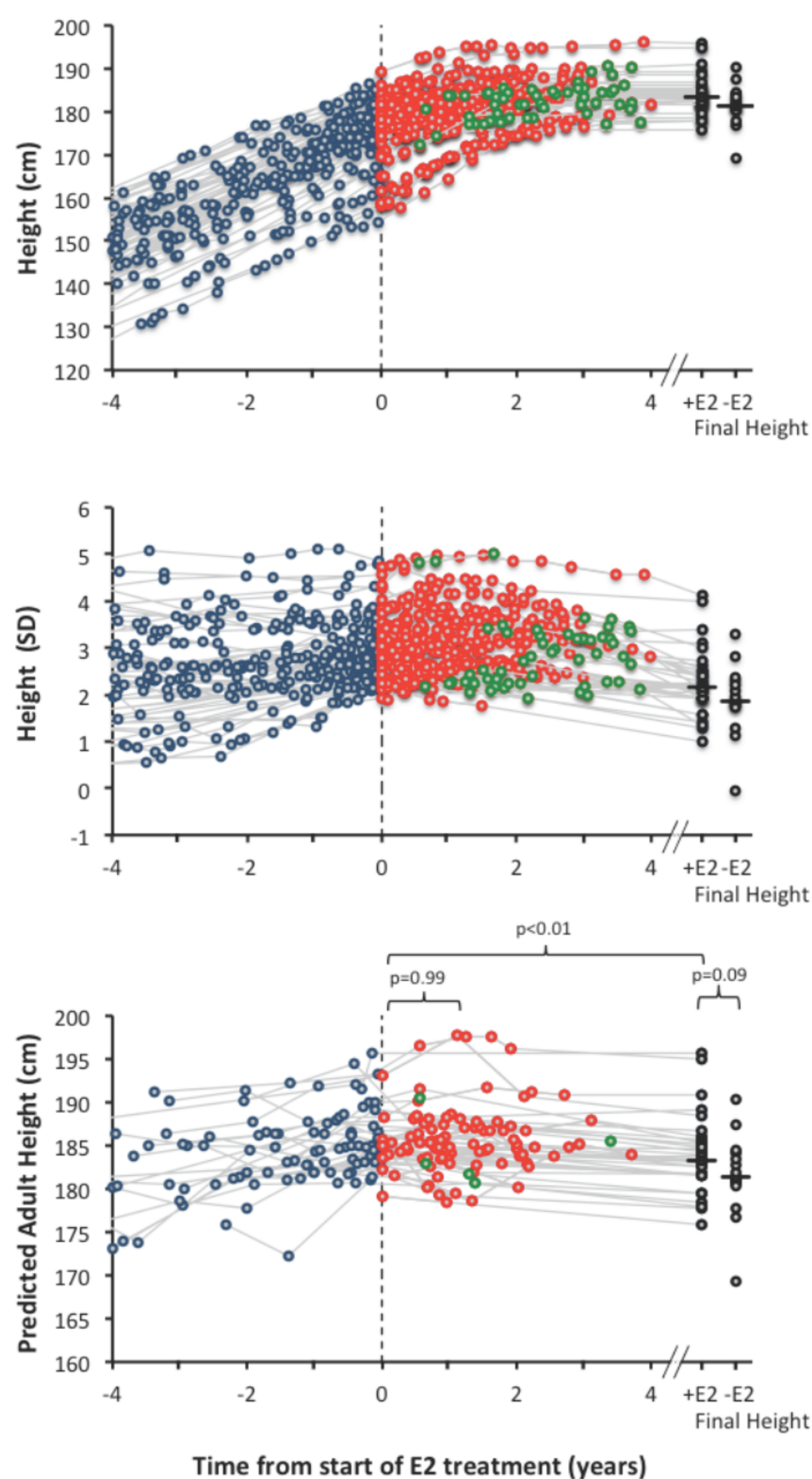
**Figure:** Reclassification of 304 girls referred with tall stature and overgrowth syndromes.

### Results

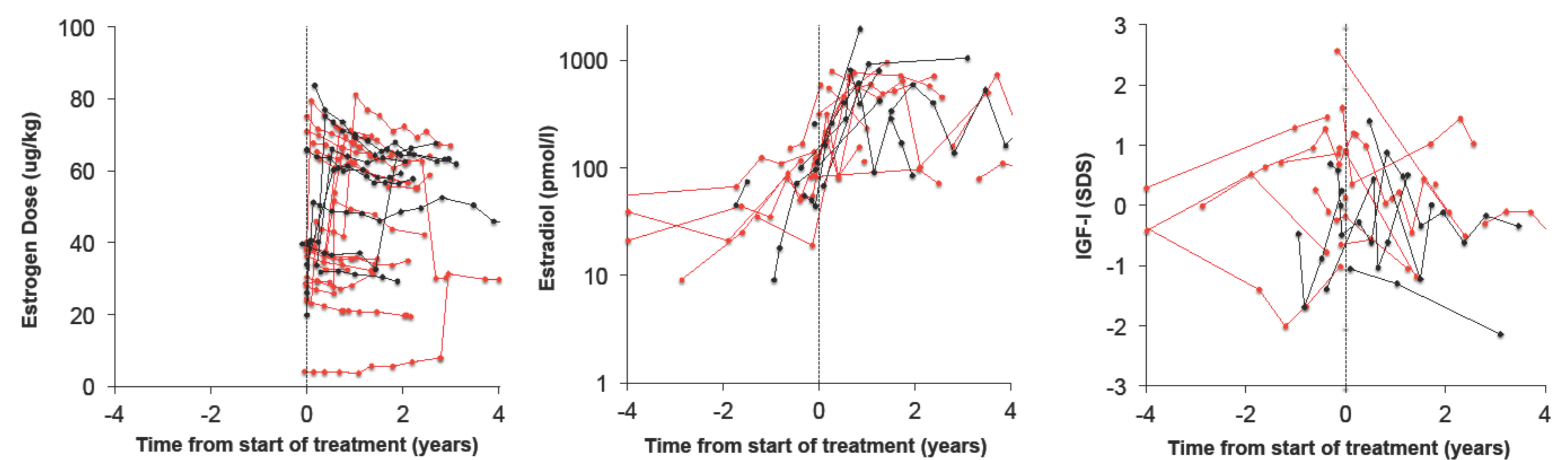
Chronological age and bone age were 11.6 years (7.95-13.4) and 11.8 years (8.9-13.3) at baseline, respectively. Bone age delay at referral was significantly greater in the treated girls (0.26 (-0.66-1.33) years) compared to non-treated girls (-0.41 years (-1.2-0.23)), p<0.05. At referral, maternal height was higher in treated girls (p<0.05) but there were no significant differences in Height SDS, AHP, FSH, LH, estradiol and IGF-I levels. Final height was reduced by E2 treatment in 18/26 compared to initial height. Overall, a reduction from an average AHP of 185.7 cm ± 3.9 cm at baseline to 184.1 cm ± 4.8 cm was observed, p<0.01, n=26. CA, BA, estradiol, estrogen dose and IGF-I at baseline did not predict height reduction.

### Conclusions

In conclusion, we found that treatment with 17β-estradiol caused a moderate reduction in final adult height. Treatment of CTS with 17β-estradiol cannot be recommended in general and should be reserved for selected cases.



**Figure:** Height, height SD and predicted adult height in 59 girls diagnosed with tall stature, before during and after 17β-estradiol treatment. Blue dots represent measurement prior to treatment, red dots during treatment and green dots after treatment. Black dots represent final height in treated (n=35) and untreated (n=16) girls.



**Figure:** Estrogen dose, serum estradiol and IGF-I (SDS) during follow-up of 26 treated girls diagnosed with CTS. Red lines (n=18) represent girls who achieved a reduction of height compared to prediction of those who did not (blue lines, n=8).

### Bibliography

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