

THE EFFECT OF HORMONE REPLACEMENT TIMING ON BONE MINERAL DENSITY ACCRUAL IN YOUNG PATIENTS WITH TURNER SYNDROME.

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Background: Turner syndrome (TS) is caused by X-chromosome monosomy with variable phenotypes, including hypogonadism and short stature. To achieve puberty, 90% of patients with TS require hormone replacement therapy (HRT) and 80% have low bone mineral density (BMD). Currently, guidelines suggest HRT start at 12 years with low-dose estrogen replacement therapy (ERT), increasing slowly, simulating pubertal progress. Studies show that ERT increases BMD in TS adolescents. Uncertainty remains for how the rate of increase in ERT affects BMD.

Materials/Methods: IRB approval was obtained from Baylor College of Medicine for this retrospective chart review from 1991-2020. Data were extracted from charts. Multilevel random effects models were constructed to assess the temporal associations between HRT and BMD. The independent variable was the time from initiating ERT to reaching final doses. The primary dependent variables were total body BMD (tbBMD) and z-scores, measured using dual-energy X-ray absorptiometry. Analyses were performed in SAS software.

Results: N= 28. The average age of TS diagnosis was 6.9; The average age for starting HRT was 14.1 years. 13 patients had spontaneous puberty before starting HRT. tbBMD increased significantly with age ($p = 0.03$). Change in BMD does not vary between patients who maximized ERT doses within 0-2.5 years, in comparison to taking 2.5-5.5 years ($p=.7$). There was a trend toward a significant difference in the change of tbBMD z-score ($p = 0.15$), with patients taking 2.5-5.5 years having a negative trend in z-scores compared to taking 0-2.5 years.

Conclusions: BMD in TS adolescents increases with age. There was a trend for tbBMD z-score to increase faster when ERT doses were maximized within 2.5 years. However, due to small sample size, we cannot prove statistical significance. This study has identified a cohort of children with TS under 12 prior to HRT or BMD measurements. This is a population for future prospective studies.

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