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Bone Mineral Density in Transgender Youth on Gender Affirming Therapies

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Background: 2% of youth identify as transgender. Many have puberty blocked with gonadotropin-releasing hormone analogues (GnRHa), followed by testosterone (T) or estradiol (E2). Bone mineral density (BMD) effects of these therapies are understudied.

Objective: For youth on GnRHa alone or T or E2 +/- GnRHa, to evaluate: (1) BMD z-scores; (2) BMD z-score differences for those +/-GnRHa; and (3) associations between GnRHa duration and BMD z-score.

Methods: Cross-sectional study of transgender youth (n=56 age 10.4-19.8 years, 53% female sex assigned at birth) undergoing total body dual-energy X-ray absorptiometry (Hologic Discovery A). Data are presented as

median and interquartile range, group differences evaluated with Mann Whitney U tests and associations with Spearman correlations.

Results: BMD z-scores on GnRHa alone (n=19) were -0.5 (-1.4, 0.3) using male norms and -0.8 (-1.7, 0.3) using female norms. BMD z-score for transgender males (TM) on T (n=21, 5 with past GnRHa): -0.2 (-0.6, 0.0) using male norms, 0.4 (-0.3, 0.8) using female norms. BMD z-score for transgender females (TF) on E2 (n=16, 6 on current/past GnRHa): -0.4 (-1.2, 0.3) using male norms, -0.2 (-1.0, 0.7) using female norms. TM on T with prior GnRHa had significantly lower BMD z-scores than TM on T alone (p=0.004); but no differences for TF on E2 +/- GnRHa. GnRHa duration was inversely correlated with BMD z-score (male norms: r=-0.5, p=0.005, female norms: r=-0.4, p=0.029). BMD z-score was unrelated to length of T/E2 therapy or sex steroid concentrations.

Conclusions: Longer durations of GnRHa therapy were associated with worse BMD z-scores.

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