Bone Health in Newcomer Children Compared to Canadian-Born Children

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Introduction

Bone health is crucial during childhood, as this period is essential for achieving optimal peak bone mass, which can reduce the risk of osteoporosis and fractures later in life. While research exists on the determinants of bone health, suggesting newcomer children may be at risk of impaired skeletal development, little is known of the bone health of newcomer children. The purpose of this study was to evaluate if there were differences in bone health between newcomer and Canadian-born children.

Keywords: Child bone development; Skeletal development; Newcomer children; Canadian-born children; Immigrant children; Distal tibia; Distal radius; Physical activity; Vitamin D intake; Bone mineral density; Cortical thickness; Migration and health; Canada; Child health equity; Kinesiology; Parent education; Social determinants of health; Health disparities.

Methods

Our cross-sectional study recruited forty-five children (12 newcomers, 33 Canadian-born) from 5 to 11 years of age. Bone health was assessed using high-resolution peripheral quantitative computed tomography (HR-pQCT) to measure total bone area (Tt.Ar), cortical area (Ct.Ar), trabecular area (Tb.Ar), total volumetric bone mineral density (Tt.vBMD), cortical density (Ct.vBMD), cortical thickness (Ct.Th), trabecular density (Tb.vBMD), trabecular thickness (Tb.Th), trabecular bone volume fraction (Tb.BV/TV), trabecular number (Tb.N), and trabecular separation (Tb.Sp) at the distal radius and tibia. Anthropometric measures were recorded and physical activity (PA) was evaluated using the Childhood Physical Activity Questionnaire. Multivariate analysis of covariance (MANCOVA) was used to assess differences in HR-pQCT bone outcomes between groups while controlling for age, sex, height, weight, and PA. Statistical significance was set at $p < 0.05$.

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Results

Newcomer children had significantly greater Ct.Ar ($p = 0.02$), Ct.vBMD ($p = 0.02$), and Ct.Th ($p = 0.01$) at the distal tibia compared to their Canadian-born peers. No significant differences were observed at the radius between groups ($p > 0.05$).

Conclusion

Contrary to previous literature, this pilot study did not find that newcomer children had impaired bone health. Instead, newcomer children demonstrated greater values for cortical bone at the distal tibia. This may be explained by our potentially healthier newcomer sample, which reported higher vitamin D intake, more educated parents, and possibly favourable premigration factors. Future research should explore the impact of refugee status, acculturation, healthcare access, PA, and diet with a larger and more ethnically diverse sample to better understand bone development of newcomer children.