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Bone health in relation to vitamin-D status and serum adipokines in obese Egyptian children

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Introduction: Childhood obesity has been linked to an increase in fracture risk, so the impact of obesity on bone metabolism is becoming a focus of attention to identify factors that may affect bone health in obese children.

Aim: This study aimed to examine the association between serum 25-Hydroxy vitamin D [25(OH) D], adipokines and bone status in those children

Method: 100 obese and 80 non obese age and sex matched children were enrolled in our study with mean age of (9.7±2.3) and (8.9±1.5) respectively. Anthropometric measurements, femoral neck Bone Mineral Density (BMD) and its Z-score, Bone Mineral Density (BMC) were measured using Dual-energy X-ray Absorptiometry (DXA) in relation to body weight (kg), we also determined serum 25(OH) D, Adiponectin, Leptin and lipid profile. HOMA-IR was calculated to assess insulin resistance.

Results: It was found that BMC, BMD and BMD Z-score adjusted for weight were significantly lower in obese children as compared to controls (all $p < 0.05$). Obese children had lower levels of 25(OH) D and Adiponectin ($P < 0.01$), while higher levels of Leptin, total Cholesterol (TC) and Triglycerides (TG) compared to controls ($P < 0.01$). Both BMC and BMD Z-score showed positive association with 25(OH)D and Adiponectin ($P < 0.01$) and -ve association with HOMA-IR, TG and TC ($P < 0.05$). Linear regression analysis showed that 25(OH) D was the most effective factor predicting BMD Z-score and BMC in obese children.

Conclusion: Obesity is negatively related to bone health in childhood. Those obese children are at increased risk for vitamin D insufficiency which shows an obvious relationship to lower bone mass, raising the question of supplementation to prevent the deleterious effect of its deficiency on bones and reducing future risk of fracture and Osteoporosis.

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