Calcium intake, physical activity and bone health status among Chinese early adolescents

ABSTRACT

The objective of this cross-sectional study was to determine the relationship between calcium intake and physical activity with bone health status among Chinese early adolescents. A selfadministered questionnaire was used to obtain socio-demographic background, family history of osteoporosis, lifestyle practices and eating habits; while daily calcium intake was assessed using one-day dietary recall and two-day dietary record. Physical activity was examined using PAQ-A (Physical Activity Questionnaire for Adolescents). Height, weight and bone health status was assessed using stadiometer, weighing scale (TANITA), and ultrasonometry QUS-2, respectively. Data was analysed using the Statistical Package for Social Sciences (SPSS), version 15.0. A total of 236 Chinese subjects were recruited into this study. The mean age of subjects was 13.6 ± 0.5 years old. Mean daily calcium intake was low, that is 573.4 ± 405.1mg. The mean score of PAQ-A was 2.14 ± 0.64. Mean weight, height, and BMI were 50.9 ± 11.4kg, 1.62 ± 0.08m and 19.40 ± 3.72kg/m2, respectively. Based on CDC classification of BMI-for-age (2000), 68.2% of subjects were in the normal category, 16.1% were underweight, 11.4% were at risk of overweight and 4.2% overweight. Mean Broadband Ultrasound Attenuation (BUA) was 77.55 ± 11.73dB/MHz. According to diagnostic criteria for osteoporosis by WHO (1994), 49.2% of subjects had normal bone mass (t-score > -1.0), more than half of the subjects were either osteopenic (49.6%) or osteopototic (1.3%). This might be due to subjects being in the early adolescents state and their peak bone mass has yet to be attained. T-test showed that there was significant difference between mean body weight among male and female subjects. There was also significant higher mean BUA among female subjects than their counterparts. Pearson correlation test showed that there was no significant relationship between BUA with calcium intake (r= -0.05, p= 0.42) or physical activity (r= 0.03, p= 0.69). However, weight had a significant positive correlation with BUA (r= 0.39, p<0.05). In conclusion, female subjects have better bone health status as compared to males. Although no significant relationship was shown between calcium intake and physical activity with bone health, these two factors are known to reduce future risk of osteoporosis. It is recommended that prevention and management of low bone mass should be focused on factors recognised as determinants of bone health status among early adolescents. This is to ensure optimal bone health being attained among the young population in reducing risk of osteoporosis in future.