BONE

High physical activity benefits the bone health of pubertal girls

High levels of physical activity from prepuberty to early adulthood are important for optimal bone mass accrual in girls, new findings from Finland reveal.

Adolescence is a critical time for bone mass accumulation and around 35% of total body and lumbar spine bone mineral content (BMC) accrual occurs during the 4 years that surround peak height velocity. Evidence is mounting that physical activity, especially weight-bearing exercise, is important for bone mass accrual during this period. In their 7-year prospective longitudinal study, Völgyi and co-investigators evaluated the effect on bone accrual of changes in physical activity level from prepuberty to early adulthood and of consistently high physical activity during the same period.

The researchers studied 202 girls from 61 schools in a region of Central Finland. The girls, who were aged 9–13 years at enrollment, completed a physical activity questionnaire at baseline and after 7 years that asked questions about the frequency and duration of their physical exercise and the types of sports that they played. With the responses, the researchers divided the girls into four groups on the

basis of consistency of physical activity: consistently low, consistently high, low-to-high and high-to-low. BMD, BMC and bone area were also assessed at multiple sites at baseline, and were not different between the four groups.

At 7 years follow up, significantly higher bone gain had occurred at a number of bone sites in girls in the consistently high physical activity group than in those in the consistently low physical activity group. For example, BMC was 12% greater at the total femur in the consistently high group than in the consistently low group. Importantly, benefits in bone gain were also evident in girls who had increased their physical activity during puberty, many of them around the time of the menarche. Specifically, girls in the low-to-high physical activity group had higher BMD at the total body and total femur and higher BMC at all sites than those in the consistently low physical activity group.

The most common activities at age 11 years included swimming and cycling, which are non-weight bearing; however, by age 18 years, weight-bearing activities, such as jogging, had become popular. The researchers hint that this change in

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exercise type might have contributed to the bone gains observed. On the basis of the study findings, the investigators point out that exercise interventions to optimize bone accrual should target prepubertal girls, as well as pubertal girls, as both will benefit.

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Original article Völgyi, E. *et al.* Long term leisure time physical activity has a positive effect on bone mass gain in girls. *J. Bone Miner. Res.* doi:10.1359/jbmr.091115