Omega-3s boost bone mass in young men - study

08/03/2007 - **Increased intake of omega-3 fatty acids, particularly docosahexaenoic acid (DHA), are linked to increased bone build up in young men, says a new study.**

"This was the first study to investigate the association between individual PUFAs, BMD, and bone mineral accrual," wrote researchers.

"In a cohort of healthy young men, we found that concentrations of n-3 fatty acids, especially DHA, were positively association with peak BMD in the total body and spine and with bone accrual in the spine," they wrote.

The new study adds to previous research reported that diets with a low ratio of omega-6 fatty acids to omega-3 fatty acids may minimise bone loss. Indeed, the new study also reports that higher ratios of n-6 to n-3 fatty acids was negatively associated with bone build up during these formative years.

The researchers recruited 78 healthy young men from high schools and sports clubs with an average age of 16.7 at the start of the study. The Northern Osteoporosis and Obesity Study (NO_2 Study) measured total body bone mineral density (BMD) using dual-energy X-ray absorptiometry, and obtained blood samples from the men to measure blood lipid profiles.

"The novelty of our study was in the measurement of fatty acids in the serum phospholipids fraction in healthy men and their association with BMD and bone accrual in our cohort," stated the researchers.

After a mean follow-up of seven years 11 months researchers report that concentrations of omega-3 fatty acids were positively linked to total BMD, spine BMD, with DHA specifically mentioned to have significant positive associations with these two measures, at age 22.

"Our key finding was a positive association between n-3 fatty acids and BMD of the total body and spine and the accumulation of BMD at the spine between 16 and 22 years of age in this cohort of healthy young men," said the researchers.

Researchers suggested that the mechanism behind the apparent benefits might come from affecting expression of the role of peroxisome proliferators-activated receptor γ (PPAR-γ), a protein that plays a role in metabolic functions and is expressed in bone marrow. Studies have shown that overexpression of this protein is linked to lower bone mass, therefore EPA and DHA, neither of which is known to activate PPAR-γ expression, may protect bone mass.

"The attainment of peak bone mass in adolescence and the prevention of age-related osteoporosis are potential positive effects of n-3 fatty acids," they wrote. *"Further elucidation of the physiological effects of n-3 fatty acids on bone health, along with clinical trials of EPA and DHA to prevent or treat osteoporosis, is needed."*

Osteoporosis is estimated to affect about 75m people in Europe, the USA and Japan. According to the International Osteoporosis Foundation, the total direct cost of osteoporotic fractures is €31.7bn in Europe, and 17.5bn in the US (2002 figure). The total annual cost of osteoporosis in the UK alone is over £1.7bn (€2.5bn), equivalent to £5m (€7.3m) each day.