STUDIES ON NUTRITION, BONE MINERALIZATION AND METABOLIC MARKERS IN HEALTHY 8-YR-OLDS IN AN URBAN SWEDISH COMMUNITY

Akademisk avhandling
som för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin
vid Göteborgs Universitet kommer att offentligen försvaras i föreläsningssal 1,
Drottning Silvias Barn och Ungdomssjukhus, Göteborg

Fredagen den 9 oktober 2009, klockan 13.00

av

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Avhandlingen baseras på följande delarbeten:

I Eriksson S, Strandvik B. Relation between socio-economic variables, food choice and overweight in healthy 8-yr-olds. (Manuscript, submitted)


Göteborg 2009
Background: The incidence of welfare diseases including overweight in childhood is increasing worldwide. The results from a study of healthy preschool children showed that in a population with well educated parents 17% of the children were overweight or obese at the age of 4 years. Gender differences in metabolic profiles and correlations between food intake and anthropometry motivated a follow-up study at the age of 8 years.

Aim: The aim of the study was to investigate nutritional intake, bone mineralization and metabolic markers in a group of healthy 8-year-olds and relate these parameters to body composition, growth, socio-economic variables, physical activity and health.

Subjects & Methods: Ninety-two previously examined children, accepted participation and an additional 28 children were included. A 24-hour dietary recall was performed. Questionnaires on food choice, health, physical activity and socio-economic variables were used. Anthropometry was measured and bone mineralization and body composition was assessed by dual energy x-ray absorptiometry. Blood samples were obtained for analysis of metabolic markers.

Results: The population was representative for Sweden except that more parents held a university degree. Seventeen % of the children were overweight. Glucose, HOMA-index and leptin differed by gender despite no difference in BMI and fat mass. Leptin was the best marker for overweight. Serum concentration of vitamin D was low (<75 nmol/L) in 62% of the children. Food choice was similar to that at 4 years of age suggesting that food habits were established at an early age. Children who consumed fat fish once a week or more had higher concentrations of n-3 serum phospholipid fatty acids and a lower n-6/n-3 ratio. Intake of saturated fat was negatively associated to anthropometry and children who consumed full fat milk regularly had a lower BMI compared to those who seldom or never drank milk. With the exception for the intake of milk and soft drinks no socio-economic influences were seen on the children’s nutritional intake. Bone mass differed by gender and weight and larger bones were found in boys and overweight children. Physical activity was associated with the bone mass in the hip for both boys and girls. Serum phospholipid fatty acid pattern was associated with bone mineralization.

Conclusions: BMI correlated strongly to fat mass and leptin was the best marker of overweight and fat mass in 8-year-olds. Food choice was similar to that at 4 years of age. An intake of fat fish once a week was associated with higher serum concentrations of n-3 fatty acids. The intake of saturated fat and full fat milk were inversely associated with BMI. Serum phospholipid fatty acids were associated with bone mineralisation. The results of the analyses for metabolic markers may provide preliminary reference intervals for healthy children.

Keywords: body composition, bone mineralization, dual energy x-ray absorptiometry, healthy, lipids, metabolic markers, overweight, physical activity.

ISBN 978-91-628-7847-4