Risk factors associated with overweight cluster already in children

March 25 2015

Lifestyle-related cardiometabolic risk factors cluster already in children in the same way as in adults, according to research from the University of Eastern Finland. A cardiometabolic risk score was used to evaluate cardiometabolic risk in different age groups. The results show that risk factor levels even lower than those generally accepted as risk factor thresholds for type 2 diabetes and atherosclerotic vascular disease are harmful when several risk factors cluster.

In addition, a common mutation on the PNPLA3 gene associated with fatty liver in adults was found to be linked to elevated liver ALAT values in overweight children.

Overweight in children is a significant public health issue worldwide. Overweight and obesity are linked to metabolic syndrome characterised by the presence of several risk factors of type 2 diabetes and atherosclerotic vascular disease. These include overweight and abdominal obesity, insulin resistance in muscles, adipose tissue and liver and the related disturbances in glucose metabolism, elevated levels of harmful triglycerides in plasma, lower levels of HDL cholesterol in plasma, and elevated blood pressure. Metabolic syndrome has also been linked to fatty liver, which is worsened by a common mutation in the PNPLA3 gene.

Clustered risk factors can be harmful already below threshold levels

The doctoral thesis of Anna Viitasalo, MD, showed that cardiometabolic risk factors cluster in a similar manner in children and adults of different ages, irrespective of the sex. Risk factor clustering was observed in all age groups; however, risk factor levels were higher in adults than children. In adults, risk factor clustering increased the risk of type 2 diabetes, myocardial infarction and premature death due to atherosclerotic vascular disease.

The study showed that risk factor levels even lower than those generally accepted in the field of medicine as risk factor thresholds for type 2 diabetes and atherosclerotic vascular disease are harmful when several risk factors cluster. When assessing the risk of these diseases, attention should increasingly be paid to the coexisting levels of several risk factors. Furthermore, healthy lifestyle habits begun in childhood and continued in adult life should be seen as the primary approach in reducing the overall risk. In addition to lifestyle changes, medication may be necessary in adults if the levels of risk factors are high.

In overweight children carrying a common mutation of the PNPLA3 gene, liver enzyme levels in plasma were higher than in other children and, during a follow-up of just two years, their liver values also increased significantly more than in other children. The gene mutation without the presence of overweight did not elevate liver values.

The study carried out at the University of Eastern Finland Institute of Biomedicine was mainly based on the Physical Activity and Nutrition in Children (PANIC) Study, which is an on-going lifestyle intervention study of 512 children aged between 6 and 8. Furthermore, the study used data from the Kuopio Ischemic Heart Disease Risk Factor (KIHD) Study focusing on middle-aged men, as well as data from the Dose Responses to Exercise Training (DR's EXTRA) Study, a lifestyle intervention study focusing on ageing women and men..

The original articles were published in *Metabolic Syndrome and Related Disrorders*, *Pediatric Obesity* and *Diabetologia*.

More information: "Clustering of Cardiometabolic Risk Factors, Liver Enzymes and PNPLA3 Polymorphism with Special Reference to Children." epublications.uef.fi/pub/urn_i … 78-952-61-1712-6.pdf

"The Physical Activity and Nutrition in Children (PANIC) Study." www.uef.fi/en/biolaaketiede/la … ikunta-ja-ravitsemus

Provided by University of Eastern Finland