# Obese kids' artery plaque similar to middle-aged adults

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The neck arteries of obese children and teens look more like those of 45-year-olds, according to research presented at the American Heart Association's Scientific Sessions 2008.

"There's a saying that 'you're as old as your arteries,' meaning that the state of your arteries is more important than your actual age in the evolution of heart disease and stroke," said Geetha Raghuveer, M.D., M.P.H., associate professor of pediatrics at the University of Missouri Kansas City School of Medicine and cardiologist at Children's Mercy Hospital. "We found that the state of the arteries in these children is more typical of a 45-year-old than of someone their own age."

Researchers used ultrasound to measure the thickness of the inner walls of the neck (carotid) arteries that supply blood to the brain. Increasing carotid artery intima-media thickness (CIMT) indicates the fatty buildup of plaque within arteries feeding the heart muscle and the brain, which can lead to heart attack or stroke.

Investigators calculated CIMT in 34 boys and 36 girls who were "at-risk," (average age 13, 89 percent white) and found:

-- These children had abnormal levels of one or more types of cholesterol – elevated levels of low-density lipoprotein (LDL), which is known as "bad cholesterol;" low levels of high-density lipoprotein (HDL), which is the "good cholesterol;" or high triglyceride levels.
-- Forty (57 percent) had a body mass index (BMI, a calculation of

weight for height) above the 95th percentile.

Their average CIMT was 0.45 millimeters (mm), with a maximum of 0.75 mm.

The children's "vascular age" — the age at which the level of thickening would be normal for their gender and race — was about 30 years older than their actual age, Raghuveer said.

The children were deemed at high risk for future heart disease because of obesity, abnormal cholesterol, and/or a family history of early heart disease.

On average, these children had:

-- total cholesterol levels of 223.4 milligrams per deciliter (mg/dL) (less than 170 is considered acceptable by American Heart Association recommendations);
-- LDL cholesterol levels of 149.8 mg/dL (less than 110 is considered acceptable); and
-- triglycerides levels of 151.9 mg/dL (below 150 is considered acceptable).

Researchers found that having a higher BMI and higher systolic blood pressure had the most impact on CIMT.

Of the various risk factors, the children with triglycerides over 100 mg/dL were most likely to have an advanced vascular age. Thirty-eight children with high triglycerides had a CIMT above the 25th percentile for 45-year-olds, while only five in the group were below the 25th percentile. Children with lower triglycerides were evenly divided between those who scored below (13) or above (14) the 25th percentile on the charts for 45-year-olds.

"Vascular age was advanced the furthest in the children with obesity and high triglyceride levels, so the combination of obesity and high triglycerides should be a red flag to the doctor that a child is at high risk of heart disease," Raghuveer said.

Further studies are needed to determine whether artery build-up will decrease if children lose weight, exercise, or are treated for abnormal lipids. Some studies have shown that CIMT can be reduced when children at extremely high risk are treated with cholesterol-lowering statin medications, and that exercise can improve blood vessel function in children with a high BMI.

"I'm optimistic that something can be done," Raghuveer said. "In children, the buildup in the vessels is not hardened and calcified. We can improve the vessel walls and blood flow in adults through treatment, and I'm sure we can help children even more."

Other risk factors for high CIMT in children are high blood pressure, exposure to secondhand smoke and insulin resistance – which is frequently seen in obese children.

Source: American Heart Association

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