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Kids' 'screen time' linked to early markers for cardiovascular disease

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Six-year-olds who spent the most time watching television, using a computer or playing video games had narrower arteries in the back of their eyes — a marker of future cardiovascular risk, in a first-of-its-kind study reported in *Arteriosclerosis, Thrombosis and Vascular Biology*: Journal of the American Heart Association.

Australian researchers found that more sedentary behavior such as "screen time" was associated with an average narrowing of 2.3 microns in the retinal arteriolar caliber. A micron is one thousandth of a millimeter or one-25th of a thousandth of an inch.

In the study, 6- to 7-year-olds who regularly participated in outdoor physical activity had 2.2 microns wider average retinal arteriolar compared to those children with the lowest level of activity.

The magnitude of the narrowing associated with each hour of television/computer viewing was similar to that associated with 10 millimeters of mercury (mm HG) increase in systolic blood pressure in children, researchers said.

"We found that children with a high level of physical activity had a more beneficial microvascular profile compared to those with the lowest levels of physical activity," said Bamini Gopinath, Ph.D., lead author and senior research fellow at the Center for Vision Research at the University of Sydney. "This suggests that unhealthy lifestyle factors may influence microcirculation early in life and increase the risk of

cardiovascular disease and hypertension later in life."

Retinal microvascular caliber is a marker for cardiovascular disease and high blood pressure in adults. But this is the first time that a sedentary lifestyle in childhood showed a narrowing of the vessels in the retina that could be a subclinical marker for cardiovascular disease in the future.

The study included 1,492 children in 34 primary schools in Sydney, Australia. Parents answered a 193-item questionnaire, providing the number of hours spent each week in indoor and outdoor physical activity and sedentary activity such as watching television, videogames, computer time and reading.

Researchers took digital photographs of the vasculature in the back of each child's eye, then calculated average retinal vascular calibers. Height, weight, body mass index (BMI) and three separate blood pressure measurements were taken and averaged.

On average, the children spent 1.9 hours per day in screen time and 36 minutes a day in total physical activity. Children in the highest levels of physical activity at just over an hour or more had significantly wider average retinal arteriolar caliber than those spending just under half an hour or less per day.

Increased screen time was associated with narrower average retinal arteriolar diameter after adjusting for age, sex, ethnicity, iris color, length of the eyeball, BMI, birth weight and blood pressure. Each hour per day of TV viewing time was associated on average with 1.53 microns narrower retinal arteriolar caliber.

"Excessive screen time leads to less physical activity, unhealthy dietary habits and weight gain," Gopinath said. "Replacing one hour a day of screen time with physical activity could be effective in buffering the

effects of sedentariness on the retinal microvasculature in children. Free play should be promoted and schools should have a mandatory two hours a week in physical activity for children."

Physical activity enhances endothelial function and increases blood flow resulting in enhanced nitric oxide production, which has a positive effect on the linings of blood vessels.

The researchers said their findings might not be applicable to other regions of the world because of the temperate climate in Australia, where children are more apt to play outdoors. Study limitations included the use of parental rather than objective measurement of the children's time spent in physical and sedentary activities.

"Parents need to get their children up and moving and off the couch," Gopinath said. "Parents can also lead the way by being more physically active themselves."

Provided by American Heart Association

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