

Study suggests other causes for childhood brain aneurysms

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A new University of Cincinnati (UC) study questions the commonly held scientific belief that childhood brain aneurysms are caused by trauma, infection or underlying vascular malformations.

In a retrospective review of 53 Ohio children with intracranial (brain) arterial aneurysms, Todd Abruzzo, MD, found that the most common type of aneurysm among all age groups appeared to occur spontaneously—with no related trauma or infection, recognizable clinical warnings signs or underlying medical causes, such as vascular malformations.

Researchers say this data suggests unknown genetic factors, environmental exposures or an interaction of the two may predispose certain children to aneurysm development.

An aneurysm occurs when a blood vessel weakens and stretches, forming a bulge in the vessel wall that can rupture and hemorrhage. Intracranial arterial aneurysms—uncommon in pediatric patients—are bulges that develop in the arteries that carry blood to the brain.

In addition, Abruzzo reports that 75 percent of the patients whose aneurysms developed spontaneously had no risk factors for vascular disease, which in adults include smoking and high blood pressure.

“This is very significant because it provides insight into the mechanisms of aneurysm formation,” says Abruzzo, an assistant professor of

radiology, neurosurgery and biomedical engineering at UC and interventional neuroradiologist at University Hospital and Cincinnati Children's Hospital Medical Center. "Most cerebrovascular specialists believe that aneurysms arise from 'mechanical fatigue' of the arterial wall—resulting from wear and tear caused by a lifetime of excessive blood pressure and flow on thin-walled cerebral arteries.

"But our study suggests that—unlike the adult disease—childhood aneurysms may be driven by unique predisposing factors that we have not yet identified. It could have much less to do with underlying conditions commonly thought to contribute to their development," he explains.

Abruzzo will present this research, believed to be one of the largest reported case series of pediatric intracranial arterial aneurysms in the United States, at 3 p.m. Wednesday, June 13, at the American Society of Neuroradiology's annual meeting in Chicago.

For the study, the neuroradiology team reviewed epidemiological, anatomical, pathological and clinical characteristics of the 53 patients—all under age 19—at Cincinnati's University Hospital, Cincinnati Children's Hospital and Columbus Children's Hospital from January 1993 to November 2006. Most of these patients had developed intracranial hemorrhage, which occurs when intracranial aneurysm ruptures.

"It turns out the aneurysms not only occurred in different places in children compared to adults, but there also appeared to be a difference in the way the disease develops," says Abruzzo. "These differences merit further investigation to give neuroradiologists the knowledge they need to develop ongoing treatment and strategies for monitoring this at-risk population."

Source: University of Cincinnati

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