# Review identifies factors associated with childhood brain tumors

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Older parents, birth defects, maternal nutrition and childhood exposure to CT scans and pesticides are increasingly being associated with brain tumors in children, according to new research from the Brown School at Washington University in St. Louis.

Brain and central nervous system tumors are the second leading cause of cancer death in children.

A team of researchers, led by Kimberly Johnson, PhD, assistant professor of social work at the Brown School, a member of the Institute for Public Health and a research member of Siteman Cancer Center, examined studies published since 2004 that analyzed the incidence of childhood brain tumors and survival in different parts of the world.

The study was published in September in *Cancer Epidemiology, Biomarkers & Prevention*.

The team reviewed studies that examined potential genetic, immune system, developmental and birth characteristics, as well as environmental risk factors.

Although established risk factors for childhood brain tumors remain limited to ionizing radiation exposure and certain cancer syndromes, "accumulating evidence suggests relatively consistent support for positive associations" between tumors and other factors.

"Our review shows that there is still not a lot known about the causes of childhood brain tumors," Johnson said. "The review identified some potentially fruitful paths to pursue. But I think the big question that still is to be answered with respect to causes of childhood brain tumors is what particular genes influence risk.

"We know some rare syndromes cause a highly increased risk, but it also seems likely that common genetic variation influences susceptibility," she said. "Much work has been done in establishing genes involved in susceptibility to adult brain tumors, but these studies have not been done, or at least not published, for childhood brain tumors.

"Part of the issue is that childhood brain tumors are rare, so it takes enormous effort and large-scale collaboration across the world to collect the samples to do these kinds of studies," Johnson said. "A need for increased international collaboration on studies is probably the most important take away of this review."

Future research should "identify interactions between genetic and environmental factors," Johnson wrote in the paper. "International coordination to collect normal and tumor specimens should be a priority."

**More information:** "Childhood Brain Tumor Epidemiology: A Brain Tumor Epidemiology Consortium Review." Johnson KJ et al. *Cancer Epidemiol Biomarkers Prev*. 2014 Sep 5. pii: cebp.0207.2014. [Epub ahead of print], www.ncbi.nlm.nih.gov/pubmed/25192704

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