

ABSTRACT

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Pediatric brain tumors as a developmental disease.

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PURPOSE OF REVIEW: Brain tumors are the most frequent solid cancer in the pediatric population. Owing to the rarity of environmental clues about their origin, it is tempting to consider these neoplasms as developmental processes gone awry. Our review will explore the heuristic power of this hypothesis and the influence of these findings on the clinical management.

RECENT FINDING: A more accurate description of cancer predisposition syndrome has shown their frequent association with developmental abnormalities. Several genes involved in pediatric brain tumor oncogenesis are involved in developmental processes. Modeling of several pediatric brain tumor in cerebral organoids, mimicking embryonal stage of brain development, indicates that early events during brain development create the conditions necessary for their oncogenesis.

SUMMARY: The onset of multiple brain tumor types early in life suggests a functional relationship between brain development and oncogenesis. A growing body of evidence seems to support the hypothesis that some of the main developmental steps in the brain can be hijacked by the tumors during their initiation. Collaborations between neuroscientists and oncologists should provide room for improvement in the knowledge for these neoplasms.

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