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Advances in the Pathology and Genetics of Pediatric Cancer

Recent advances in molecular diagnostics that can analyze the tumor's genetic make-up have provided greater understanding of pediatric cancers. Pediatric malignancies are much rarer and different from adult tumors, in their histology, molecular pathogenesis and response to treatment. They are more often induced by inherited or sporadic errors in development rather than by environmental exposure. The landscape of genomic alterations in pediatric cancer shows significant differences from adult cancers in terms of mutation frequency and type of altered genes. Childhood malignancies have a relatively high prevalence of specific structural variations (e.g., gene fusions and chromosomal rearrangements) and exhibit high specificity of associations with histologic tumor subtypes. Pediatric tumors have a fewer number of actionable targets than adult tumors, thus potentially limiting the utility of precision oncology in children. The use of next-generation sequencing (NGS) methods coupled with limited morphologic classification has offered better insight into the diagnosis, prognosis and practical clinical management of patients, and obviated the need for extensive immunohistochemical and molecular tests. Molecular classification of tumors has replaced extensive histologic subtyping and has provided better prognostic information for patients.

Biography:

Atif A. Ahmed is Professor of Pathology and Director of the Anatomic Pathology Division at Children's Mercy Hospitals, Kansas City, Mo, USA. Dr. Ahmed is a board-certified pathologist, graduated from Medical School in 1988, completed pathology residency and fellowship training in the U.S.A. and has been in academic practice for more than 15 years. His research interests include pediatric tumor biology and targeted biomarkers in cancer. Dr. Ahmed published more than 90 publications including peer-reviewed articles, book chapters and meeting abstracts. He is the book editor of "Gastrointestinal Stromal Tumors in Adults and Children" and "Anatomic and Clinical Pathology Board Review". He is a Member of the Society for Pediatric Pathology, the Children's Oncology Group, and the American Association for Cancer Research; a Life Fellow of the College of American Pathologists; and an overseas fellow of the Royal College of Pathologist [UK]. He serves on the editorial board of several journals.