

Clues to Increasing Trend of Childhood Leukaemia and Other Cancers in Some Populations

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Leukaemia is the most common cancer in children living in industrialized countries. Its incidence has dramatically increased the last decades in certain populations such as Latino children in the United States, who have experienced a 35 percent increase in incidence rate in the past 40 years. Upward trends have also been observed for other cancers in children and adolescents with some variation by tumor site and geographical region.

These observations overall point to the important role of the “environment” in a broad sense, whether acting alone or in concert with genetic factors, but can we say more? Despite decades of epidemiologic research on childhood leukaemia, recent reports and publications often start with a general statement like “...*We do not know what causes childhood leukemia...*” or “...*only 10% of childhood leukemia can be explained...*”

This session will challenge this perception by presenting the most salient results on the child’s and parents’ exposures to carcinogens such as those contained in paints, solvents, pesticides, and tobacco smoke and the risk of childhood leukaemias, drawing from the work conducted in the past decades at the California-based Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE), the Childhood Leukemia International Consortium (CLIC), and other studies (note: the role of air pollution, another important risk factor of childhood leukaemia, will be presented in separate talks during the conference).

Since in utero nutrition is recognized as contributing to the alteration of gene expression and physical development in the fetus (developmental origins of health and disease), we will also assess whether a healthy maternal diet during pregnancy and prenatal folate/vitamin supplementation reduce the risk of childhood acute leukaemia.

A critical review of complementary study designs of childhood leukaemia studies using various populations and sources of data, biomarkers of exposures, and molecular characterization of childhood leukemia subtypes will be presented to evaluate association vs. causation. Future research directions will be discussed on how to characterize cumulative exposures and how to further integrate genetic and mechanistic studies to strengthen the evidence.

Advances in our understanding of actionable risk factors that increase or decrease the risk of childhood leukaemia have been made at a faster pace than for most other childhood cancers, yet similar associations with chemical and nutritional factors have also been reported for certain solid tumors, suggesting a cumulative impact of these factors. Whether this information is sufficient to start prevention will be discussed later in this conference.

References

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Additional information on CIRCLE and CLIC is available at www.circle.berkeley.edu