

Mental Retardation and Learning Disability in Survivors of Childhood Cancer Diagnosed in Infancy: A Report from the Childhood Cancer Survivor Study

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This analysis used survivors (n=4,782) and sibling controls (n=3,846) from the Childhood Cancer Survivor Study (CCSS) to examine the developmental effects of cancer diagnosed and treated in specific childhood periods for later identification of mental retardation and learning disability controlling for different types and later cancers, different treatments, and socio-demographic factors (income, ethnicity, gender). The odds of mental retardation in survivors were more than 6 times that for sibling controls. Compared to survivors diagnosed with cancer in infancy, the odds of mental retardation in survivors diagnosed with cancer at ages 2-4, 5-10, and 11+ decreased by factors of .5, .3, and .1, respectively. Compared to survivors diagnosed with CNS cancers, the odds of mental retardation in survivors diagnosed with leukemia, Wilms (kidney) cancer, neuroblastoma, or soft tissue sarcoma decreased by factors ranging from .09 to .19. The odds of mental retardation in survivors increased if chemotherapy was delivered intrathecally (compared to no chemotherapy) or if the brain was the target of radiation (compared to no radiation). The odds of mental retardation in survivors decreased the older they were at follow-up, and the odds of mental retardation increased with higher numbers of malignancies. Findings for learning disability in a sample that did not include survivors diagnosed with mental retardation followed the same pattern. In developmental science, infancy is considered a special stage in human ontogenesis. Not only does the brain undergo crucial forms of development then, but experiences in infancy are believed to be long-lasting. The CCSS database shows strong “infant effects” of cancer. Furthermore, the results stand apart from sociodemographic factors and later-occurring cancers.