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Childhood Cancer Survivors' Exposure to Chemotherapy, Radiation Does Not Increase Risk of Children's Birth Defects [1]

JCO Research Round Up
December 12, 2011

A large, retrospective study has shown that children of childhood cancer survivors who received prior treatment involving radiation to testes or ovaries and/or chemotherapy with alkylating agents do not have an increased risk for birth defects compared to children of survivors who did not have such cancer treatment. Radiotherapy and chemotherapy with alkylating agents are DNA-damaging treatments, affecting both cancer and healthy cells. The findings provide reassurance that increased risks of birth defects are unlikely for cancer survivors who are concerned about the potential effects of their treatment on their children, and help guide family planning choices.

In many cases, childhood cancer survivors receive lifesaving but aggressive therapy that can affect their ability to have children. However, studies completed to date have not adequately addressed the question of whether genetic damage from treatment could cause birth defects, such as Down syndrome and cleft lip. Genetic defects are rare in the general population, and while previous research results indicated little or no increased risk for genetic birth defects, such studies were relatively small in size and lacked detailed information about specific radiation and chemotherapy treatments.

Investigators used information from a very large cohort of more than 20,000 childhood cancer

survivors diagnosed between 1970 and 1986. They examined information on birth defects in nearly 4,700 children of childhood cancer survivors. These survivors had reported their children's health problems through questionnaires, and investigators examined the children's medical records. They also used the survivors' medical records to look at their treatment history of radiation to the reproductive organs and chemotherapy.

Overall, 2.7 percent (129) of the children had at least one birth defect, which is also comparable to the rate of birth defects in the general population (about 3 percent). Researchers found that 3 percent of children of mothers exposed to radiation or chemotherapy with alkylating agents had birth defects, compared to 3.5 percent of children of mothers who were cancer survivors but did not have such exposures. Only 1.9 percent of children of male cancer survivors treated with these DNA-damaging agents had such birth defects, compared to 1.7 percent of children of male survivors who didn't receive this type of chemotherapy or radiation. They concluded that children of cancer survivors were not at higher risk for birth defects stemming from parents' exposure to alkylating agent chemotherapy and/or radiation.

The study is among the largest to examine birth defects in children of childhood cancer survivors, and among the first to evaluate birth defects using medical records to quantify radiation and chemotherapy exposures.

What this Means for Patients

This large study showed that children of childhood cancer survivors do not have an increased risk for genetic birth defects - despite the fact that their parents received treatment that may affect their DNA. Smaller, previous studies have reported similar findings, and the current study should provide significant reassurance for cancer survivors and their physicians.

Helpful Links

Cancer Survivorship: Next Steps for Patients and Their Families [2]

Guide to Childhood Cancer [3]

Childhood Cancer Survivorship [4]

The Genetics of Cancer [5]

Links
[1] http://www.cancer.net/childhood-cancer-survivors-exposure-chemotherapy-radiation-does-not-increase-risk-children-s-birth
[2] http://www.cancer.net/patient/Survivorship
[3] http://www.cancer.net/patient/Cancer+Types/Childhood+Cancer
[4] http://www.cancer.net/patient/Survivorship/Childhood+Cancer+Survivorship

[5] http://www.cancer.net/patient/All+About+Cancer/Genetics/The+Genetics+of+Cancer