CORRESPONDENCE

Breast Cancer in Young Women After Treatment for Hodgkin's Disease During Childhood or Adolescence: An Observational Study With up to 33-Year Follow-up

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App for Aftercare

The article confirms the sobering reality of secondary breast cancer after curative treatment for Hodgkin's disease/ lymphoma (1). This late complication, along with cardiovascular disorders, ranges among the most serious late sequelae of treatment for Hodgkin's lymphoma (2).

In view of the steadily rising prevalence rates of patients as survivors of cancer, the question that arises concerns effective aftercare and prevention of secondary malignancies. In the US, this topic has already become organized and institutionalized at the highest level, with the Office of Cancer Survivorship (OCS) at the National Cancer Institute, of the National Coalition of Cancer Survivorship (NCCS) and the "Children's Oncology Group." As described by the authors, such lifelong risks after treatment for malignancy require clearly defined and structurally organized responsibilities for the aftercare and, equally, preventive screening of survivors (3). In order to enable a simple navigation through the many institutions that are currently involved in aftercare, Boer et al., from Groningen/Netherlands, have tapped into the *zeitgeist* and developed a so called survivor care app for smartphones, whose many options and advantages are obvious, especially compared with written questionnaires or aftercare reports (4): https://itunes.apple.com/us/app/survivor-care. As in Hodgkin's lymphoma, the nodular-sclerosing type is the most common (70%), the question arises to what extent common genetic susceptibilities are present for the primary cancer and the secondary breast cancer: is there a correlation with the intrinsic subtypes of breast cancer? Finally, I wish to underline that avoidance of noxious substances—such as cigarette smoking and alcohol—is crucial for the prevention of secondary neoplasias.

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Consider Family History

The authors (1) point out that the risk of developing cancer in young women after treatment for Hodgkin's disease in childhood or adolescence corresponds, up to age 50, with the high risk in the case of hereditary disposition in the high risk genes *BRCA1/2*. We provided genetic counseling for a 36-year-old woman who developed bilateral breast cancer at the ages of 26 and 35, after having been treated for Hodgkin's lymphoma and receiving radiotherapy at age 17. In her family history, we noticed an accumulation of cancers, among them breast cancer and prostate cancer. The patient opted for genetic testing, which identified the pathogenic mutation c.767_768delCA; p.(Thr256LysfsTer19) in the tumor suppressor gene *BRCA2*. To our knowledge, the current literature provides no evidence that women with Hodgkin's disease and subsequent breast cancer are at higher risk for having a *BRCA1/2* or other risk gene mutation. Individual cases have been reported (2), but no results from prospective clinical trials are available. It is therefore unclear to what extent these or other genetic factors influence the risk for radiotherapy-induced breast cancer subsequent to Hodgkin's disease. For our patient, knowing that she carries a *BRCA2* mutation implies a higher risk for other *BRCA2* gene-associated cancers, especially ovarian cancer. According to the German breast cancer S3 guideline, prophylactic removal of the ovaries and Fallopian tubes (salpingo-oophorectomy) should be recommended to *BRCA1/2* mutation carriers at the age of about 40, once they have had children if so desired. This procedure not only drastically reduces the risk of developing ovarian cancer but is also associated with improved overall survival. For this reason, we wish to point out the importance of considering the family history in women with breast cancer subsequent to radiotherapy for Hodgkin's disease.

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In Reply:

The authors of the article agree that a thorough family history is needed in female patients included in the screening program who are at high risk for developing breast cancer following treatment for Hodgkin's disease. The guidelines provide for an initial examination of young adult women at risk for breast cancer. However, there should be no delay in admitting patients as early as possible to the centers of the consortium for familial breast cancer even though the results of genetic counseling and investigations are not yet available. The necessary consultations can be performed in parallel to the breast cancer screening.

We also support Dr Tsamaloukas in advocating an effective follow-up for long-term survivors of malignancies. We published prospective findings of the incidence of breast cancer as one of the late effects of Hodgkin lymphoma treatment. (1). Additional publications have shown that long-term follow-up has been organized not only in the US but also in Germany, for pedriatric patients (2–4). The guidelines of the Association of the Scientific Medical Societies in Germany (Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften, AWMF) by S. Schuster et al. give additional information for identification, prevention and treatment of children, adolescents, and young adults with cancer. This guideline introduces concepts for the immediate and long-term follow-up for these patients.

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Conflict of interest statement
The authors of all contributions declare that no conflict of interest exists.