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Hodgkin Lymphoma

Development and validation of risk prediction models for coronary heart disease and heart failure after treatment for hodgkin lymphoma.

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PURPOSE

Previous efforts to predict absolute risk of treatment-related cardiovascular diseases (CVDs) have mostly focused on childhood cancer survivors. We aimed to develop prediction models for risk of coronary heart disease (CHD) and heart failure (HF) for survivors of adolescent/adult Hodgkin lymphoma (HL).

METHODS

For model development, we used a multicenter cohort including 1,433 five-year HL survivors treated between 1965 and 2000 and age 18-50 years at HL diagnosis, with complete data on administered chemotherapy regimens, radiotherapy volumes and doses, and cardiovascular follow-up. Using cause-specific hazard models, covariate-adjusted cumulative incidences for CHD and HF were estimated in the presence of competing risks of death because of other causes than CHD and HF. Age at HL diagnosis, sex, smoking status, radiotherapy, and anthracycline treatment were included as predictors. External validation for the CHD model was performed using a Canadian cohort of 708 HL survivors treated between 1988 and 2004 and age 18-50 years at HL diagnosis.

RESULTS

After a median follow-up of 24 years, 341 survivors had developed CHD and 102 had HF. We were able to predict CHD and HF risk at 20 and 30 years after treatment with moderate to good overall calibration and moderate discrimination (areas under the curve: 0.68-0.74), which was confirmed by external validation for the CHD model (areas under the curve: 0.73-0.74). On the basis of our model including prescribed mediastinal radiation dose, 30-year risks ranged from 4.0% to 78% for CHD and 3.0% to 46% for HF, depending on risk factors.

CONCLUSION

We developed and validated prediction models for CHD and HF with good overall calibration and moderate discrimination. These models can be used to identify HL survivors who might benefit from targeted screening for CVD and early treatment for CVD risk factors.