Long-term overall and cardiovascular mortality following childhood cancer: the role of cancer treatment.

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Background Childhood cancer survival has increased considerably during the last 3 decades. Until now, little has been known about the risk factors for death due to cardiovascular diseases in long-term survivors of a childhood cancer. Methods We investigated long-term mortality in a cohort of 4 122 5-year survivors (aged 0-15 years) of a childhood cancer treated between 1942 and 1986 in 8 centres in France and Great Britain as having a solid cancer and followed up over an average of 26 years. 98% of vital status were obtained from INSEE and 95% of causes of death from Cepi-Dc. Information about chemotherapy was collected, and the radiation dose received in all except for 159 of the 2 870 patients, who had received radiotherapy was estimated, The radiation dose received at 188 anatomical sites are estimated for each radiotherapy course of every child. The classification of causes of death was based on a comparison between the code topographic first cancer and the leading cause of death. The causes of death from heart disease the most common are: heart disease, heart failure and acute myocardial infarction Results A total of 603 patients died during the follow-up, i.e. 8.3-fold (95% CI 7.6-9.0) more than that expected in the general population. A total of 32 patients died of cardiovascular diseases, i.e. 4.8-fold (95% CI 3.3-6.7) more than expected, 21 of which were cardiac diseases, i.e. 6.0-fold (95% CI 3.8-9.0) more than expected. Patients who had received radiotherapy had a 5.4-fold (95% CI 1.6-33.0) higher risk of mortality due to cardiovascular disease than those who had not. Mortality due to cardiac disease was related to the administration of anthracyclines, alkylating agents and/or vinca alkaloids. Patients who had received between 5 to 14.9 Gy to the heart during radiotherapy had a 14.5-fold (95% CI 2-291) higher risk of mortality from cardiac diseases than patients who had not received radiotherapy. Patients who had received on average, more than 5 Gy to the brain were at a higher risk of developing vascular diseases (n=11). Conclusions Childhood cancer survivors are at a high long-term risk of mortality from cardiac diseases when treated with radiotherapy if the average radiation dose to the heart is higher than 5 Gy, or with anthracyclines, alkylating agents and/or vinca alkaloids. The cardiovascular diseases are the causes non-cancerous most frequent in the very long term after treatment for cancer of the child.

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