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Pregnancy after cancer in girls and women in Scotland: a population-based analysis

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Study question:

We assessed the proportion of women having a pregnancy after cancer diagnosis compared with population-based controls to provide an unbiased analysis.

Summary answer:

Cancer survivors were 38% less likely to achieve a pregnancy compared to women in the general population; almost all diagnostic groups showed an impact.

What is known already:

Many treatment regimens for cancer are known to impact negatively on female fertility, but most studies address the prevalence of surrogates for fertility such as ovarian function. The most detailed analyses, from the US Childhood Cancer Survivor Study, only includes women up to the age of 21 at diagnosis, and is not population based.

Study design, size, duration:

We performed a retrospective cohort study relating first incident cancer diagnosed between 1981 and 2012 to subsequent pregnancy in female patients in Scotland aged 39 years or less at cancer diagnosis. Pregnancies were included up to end of 2014.

Participants/materials, setting, methods:

Scottish Cancer Registry records were linked to hospital discharge records to calculate standardised incidence ratios (SIR) for pregnancy, standardised for age and year of diagnosis. We also selected women from the exposed group who had not been pregnant prior to their

cancer diagnosis who were compared with a matched control group from the general population. Additional analyses were performed for breast cancer, Hodgkin lymphoma and leukaemia.

Main results and the role of chance:

Cancer survivors (n=23,201) achieved fewer pregnancies: 6,627 observed compared to 10,736 expected pregnancies, SIR 0.62 (95% CI 0.60-0.63). The reduced SIR was observed for all age groups, falling progressively with age at diagnosis, was reduced for women across almost all cancers (ranging from 0.34 (0.31-0.37) for cervical cancer to 0.87 (0.84-0.90) for skin cancers), and varied by deprivation, being lowest in women from the most deprived quintile. SIR varied strongly by period of cancer diagnosis, being lower with earlier period of diagnosis ie 1981-1988, SIR 0.47 (0.44 – 0.50); 2005-2012, SIR 0.64 (0.60 – 0.69) (skin cancer excluded). 20.6% of cancer survivors achieved a first pregnancy after cancer diagnosis (2,114 first pregnancies in 10,271 women), compared to 38.7% in controls (ratio 0.53, 0.51-0.56), with significant reductions in women with breast cancer (ratio 0.44), leukaemia (0.30) and Hodgkin lymphoma (0.65). The effect was less with more recent treatment period: this was particularly notable for Hodgkin lymphoma, but not leukaemia or breast cancer. The proportion of first pregnancies that ended in termination was lower among women with previous cancer (11.2% vs 14.7% of pregnancies, CI of difference -5.0, -2.0%) but there was no difference in risk of miscarriage or stillbirth.

Limitations, reasons for caution:

Details of treatments received were not available, so the impact of specific treatment regimens on fertility could not be assessed. Limited duration of followup was available for women diagnosed in the most recent time period.

Wider implications of the findings:

This analysis provides robust, population-based evidence for the extent of the effect of cancer and its treatment on subsequent pregnancy across the reproductive age range. The major impact on subsequent pregnancy in some common cancers highlights the need for enhanced strategies to preserve fertility in girls and young women.

Trial registration number:

not applicable

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