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What is the effect of first line cancer treatment in girls under the age of 18 years?

During the last 50 years, cancer diagnoses in children and adolescents have progressed from being a serious potentially fatal disease to a most often curable disease.This progress has created an awareness of quality of life aspects after cancer, highlighting that successful treatment may compromise fertility after recovery.
In most cases in young girls,first line cancer treatment is initiated with low-risk regimens, but if more aggressive treatment is needed, harvesting ovarian tissue for fertility preservation will be considered.Thus, the question is: What is the potential gonadotoxic insult caused by a first-line cancer treatment on the fertility potential in prepubertal and adolescent girls?

This issue highlights the recent publication In Fertilty Sterility discussing the above issue.

Effect of first line cancer treatment on the ovarian reserve and follicular density in girls under the age of 18 years

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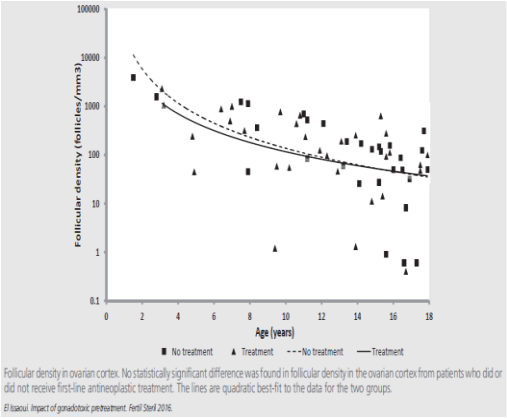
Objective: To study the impact of first-line antineoplastic treatment on ovarian reserve in young girls returning for ovarian tissue cryopreservation (OTC) in connection with a relapse.

Design: Retrospective case-control study.

Materials and methods: Sixty-three girls under the age of 18 (range: 1.5–17.9) years who had been referred to one of the three centers that participate in the Danish program for fertility preservation by OTC between the years 2002 and 2014 underwent OTC before (group 1: 31 patients) and after (group 2: 32 patients) their initial cancer treatment.

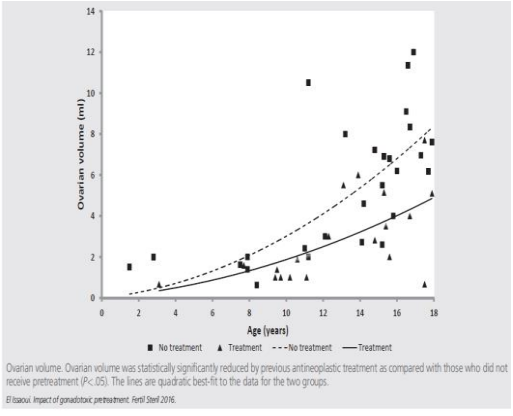
Main Outcome Measure(s): Follicular densities (follicles/mm3) measured from an ovarian cortical biopsy before OTC. The ovarian volume (mL) of entire ovaries excised for OTC was also monitored.

Result(s): There was no statistically significant difference in the mean age or follicular density between groups 1 and 2 (334 +/- 476/mm3 vs. 327 +/- 756/mm3). In contrast, the ovarian volume and total number of ovarian cortex chips cryopreserved were statistically significantly lower in patients who received gonadotoxic treatment before OTC (mean +/-standard deviation [SD]: ovarian volume,5.3 +/-3.1 mL vs. 2.9 +/- 2.1 mL, respectively; number of cortex chips: 21.3 +/-8.1 vs. 15.2 +/-7.1, respectively). The reduction in the estimated ovarian reserve ranged from 10% to 20% in children to around 30% in adolescent girls (>10 years).



Follicular density in ovarian cortex. No statistically significant difference was found in follicular density in the ovarian cortex from patients who did or did not receive first-line antineoplastic treatment. The lines are quadratic best-fit to the data for the two groups.

El Issaoui. Impact of gonadotoxic pretreatment. Fertil Steril 2016.



Ovarian volume. Ovarian volume was statistically significantly reduced by previous antineoplastic treatment as compared with those who did not receive pretreatment ($P< .05$). The lines are quadratic best-fit to the data for the two groups.

El Issaoui. Impact of gonadotoxic pretreatment. Fertil Steril 2016.

Key points:

In girls under the age of 10 years, first-line cancer treatment does not compromise the ovarian reserve by more than 10%.

Adolescent girls between 11 and 18 years may experience an estimated reduction of 30% of their ovarian reserve.

The precise long-term consequences of having a 30% reduced ovarian reserve are not known today, but the information is important in the counseling of the young patients and their parents and to determine whether fertility preservation should be performed.

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