Commentary: Does tubal sterilization reduce the risk of gynaecological cancers?

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Tubal sterilization is the most common form of birth control used in the world.\(^1\) Between 1994 and 1996, more than 2 million tubal sterilizations were performed in the US,\(^2\) with 28% of women aged 15–44 years relying on this method of contraception.\(^3\) Advances in laparoscopic techniques have resulted in a substantial increase in the number of women undergoing tubal sterilization, with nearly all interval procedures (i.e. not timed with a pregnancy) currently being performed in an outpatient setting.\(^2\)

A reduced risk of ovarian cancer has consistently been seen following tubal sterilization in both case-control\(^4\) and cohort\(^5\) studies. No association with either endometrial or cervical cancer has been established however. Results from this Danish, population-based record-linkage study\(^6\) support the established protective effect of tubal sterilization against ovarian cancer and indicate a similar protective effect on endometrial cancer. Although the study involved over 65,000 women with a tubal sterilization, there were only 30 endometrial cancer cases making it difficult to form conclusions regarding the risk of this tumour type. No link was found with cervical cancer. The reduced risk of ovarian cancer was apparent for the non-mucinous subtypes only, supporting claims that mucinous ovarian cancer may have a somewhat separate aetiology.\(^7\) The study also reports an elevated risk of cervical intraepithelial neoplasia (CIN) 3 in the first year after sterilization, which is likely due to a screening effect from Pap smears accompanying the sterilization procedures.

The protective effect of tubal sterilization on ovarian cancer appeared to persist for many years after the procedure, which is consistent with the findings of a number of other studies.\(^4,5\) A similar effect was seen for endometrial cancer. This finding is inconsistent with the association that would be expected if the protective effect was due to screening for pre-malignancy during the procedure. The association is therefore likely to be biological. But what is the biological link? Earlier reports suggested that the tubal sterilization procedure may result in reduced blood supply to the ovary and thus alter ovarian hormone levels and function.\(^8\) Tubal sterilization has also been linked to a reduced risk of breast cancer,\(^9\) supporting a hormonal effect of the surgery. However, recent data do not support an effect of tubal sterilization on ovarian function\(^10\) or on hormone levels.\(^11\) This apparent inconsistency may be due to changes in sterilization methods over time, with recent laparoscopic techniques possibly causing less damage to the tube and the surrounding mesosalpinx.\(^12\) It is possible then that tubal sterilizations performed more recently may not have the same protective effect against ovarian cancer that early procedures did—future studies may reveal a change in the association.

Alternatively, it has been suggested that tubal sterilization reduces the risk of ovarian cancer by blocking the ascent into the peritoneal cavity of potentially carcinogenic agents such as talc, asbestos, contraceptive foams or gels, uterine growth factors, or retrograde endometrium.\(^4\)

A limitation of the current study was the inability to control for confounding by other reproductive and contraceptive factors. Previous studies on ovarian cancer have not seen considerable levels of confounding by other factors,\(^3\) suggesting the present association with ovarian cancer is unlikely to suffer from a large degree of confounding. However, a previous study of endometrial cancer found that the effect of tubal sterilization was confounded by parity and oral contraceptive use,\(^13\) suggesting that the current association with endometrial cancer may be biased. One advantage of the current study is lack of bias by patient recall, however, this is unlikely to be of major concern in retrospective studies as indications are that tubal ligation is recalled very accurately by women.\(^14\)

As tubal ligation is such a common form of contraception, it is important to assess the long-term health effects of the procedure. The study by Kjaer et al.\(^6\) has revealed a likely long-term reduction in the risk of ovarian cancer and possibly on endometrial cancer. Although the reasons for the association with ovarian cancer are not clear, it is an important consideration for women who are contemplating this form of contraception.

References