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SPECIAL ARTICLE

Gynecology

FIGO position statement on opportunistic salpingectomy as an ovarian cancer prevention strategy

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Abstract

Epithelial ovarian cancer, with the highest mortality rate among gynecologic malignancies, often goes undetected until advanced stages due to non-specific symptoms. Traditional prevention strategies such as bilateral salpingo-oophorectomy (BSO) are limited to high-risk women and induce surgical menopause, often leading to significant health concerns. Recent findings suggest that many serous epithelial ovarian cancers originate in the fallopian tubes rather than the ovaries. This has led to the hypothesis that salpingectomy, with preservation of the ovaries, may reduce the risk of ovarian cancer while avoiding the adverse effects of early menopause. Studies show that bilateral salpingectomy (BS) significantly reduces ovarian cancer incidence even in average-risk women. Bilateral salpingectomy has been demonstrated to be safe with minimal added operative time, no adverse effects on ovarian function and is also cost effective. Opportunistic salpingectomy (OS), at the time of non-gynecologic surgeries, is a promising strategy for reducing ovarian cancer risk, especially among average-risk women who have completed childbearing. It offers a safe and cost-effective alternative to traditional methods. Emerging data supports incorporating OS into standard surgical practices for benign gynecologic conditions and considering it during unrelated abdominal/pelvic surgeries after adequate patient counseling and informed consent. Further training of non-gynecologic surgeons in OS is recommended to expand its preventive benefits.

KEYWORDS
cancer prevention, opportunistic, salpingectomy

1 | INTRODUCTION

Epithelial ovarian cancer has the highest mortality rate of all gynecologic malignancies, with an overall five-year survival rate of 30% to 40%.[1] This poor prognosis is due to non-specific and delayed symptoms leading to late detection at an advanced stage of disease. Despite the progress in cancer prevention and treatment over the years, only limited improvements have been made in ovarian cancer. Although there are well recognized risk factors for ovarian cancer including genetic predisposition such as BRCA mutations, studies aimed at the detection of ovarian cancer at an early stage of disease using imaging modalities or tumor markers have failed to show substantial survival benefit even in high-risk patients.[2] Ovarian cancer mainly develops in older women, and about half of the women

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who are diagnosed with ovarian cancer are over 60 years of age. The onset of ovarian cancer is known to be earlier for those with a genetic predisposition with an average age of 51 years for BRCA1 carriers and 61 years for BRCA2 carriers.[3]

When studying the ovarian cancer population overall, the majority of cases still arise in the average-risk population.[4]

Prevention measures that are both safe and effective are urgently needed. Currently, the only option for prevention of ovarian carcinoma is bilateral salpingo-oophorectomy (BSO), which is only recommended for high-risk women at a certain age according to their calculated risk of developing ovarian cancer[5] and it is known to reduce the risk to about 2% as a similar cancer can still develop from the peritoneal surface.[6] It is not appropriate to recommend BSO to the premenopausal population as it results in immediate surgical menopause, which in turn carries comorbidity such as neurologic deficits, bone density deterioration, cardiovascular disease as well as metabolic disorders.[7] In addition, surgical menopause before the age of 45 in the general female population is associated with an increased risk of earlier death.[8]

Over the past two decades, it has become apparent and more commonly accepted that serous epithelial ovarian cancer, the most common histologic subtype of ovarian cancer, probably arises from the epithelium of the fallopian tube rather than from the ovary itself.[9]

Serous tubal intraepithelial carcinoma (STIC) is thought to be the precursor lesion within the fallopian tube for many high-grade serous carcinomas, carcinosarcoma and undifferentiated carcinomas.[10] STIC is defined as dysplastic changes located in the fimbrial portion of the fallopian tube and has a reported incidence of 0.6% to over 10% in BRCA carriers or women with a strong family history of breast or ovarian carcinoma.[11,12] Among high-grade serous ovarian cancers, up to 60% have STIC lesions.[13]

The fact that serous precursor lesions often arise in the fallopian tube has given rise to the hypothesis that salpingectomy with ovarian preservation, after the completion of childbearing, may reduce the risk of ovarian cancer, allowing longer health benefit from endogenous ovarian hormones before menopause.[14,15]

2 | EMERGING DATA

A growing body of published evidence supports the effect of bilateral salpingectomy on reducing ovarian cancer incidence.[16–21] While tubal ligation (TL) alone appears to reduce ovarian cancer risk by about 30%, salpingectomy performed for sterilization or other benign indications among the general population conveys an even greater ovarian cancer risk reduction of 42%–77%.[16,17] Notably, the risk of serous ovarian and primary peritoneal cancer may be reduced by nearly 80% among average-risk women undergoing salpingectomy for non-risk reduction indications.[17] Yoon et al. performed a meta-analysis with the previously described studies and observed an overall risk reduction of 49% in ovarian cancer risk after bilateral salpingectomy.[22]

A recent population-based retrospective cohort study by Hanley et al. included all individuals in British Columbia, Canada, who underwent hysterectomy with bilateral salpingectomy or hysterectomy with TL between 2008 and 2017 and found significantly fewer observed serous ovarian cancers in the salpingectomy group. At baseline, the salpingectomy group had an increased risk for ovarian cancer; older women; fewer pregnancies or live births; more endometriosis, and yet still had a lower incidence of ovarian cancer. It is important to note in this cohort study that there was no difference between expected and observed breast cancers and no difference between expected and observed colorectal cancers.[23]

3 | BILATERAL SALPINGECTOMY

Bilateral salpingectomy is defined as the surgical excision of both fallopian tubes, up to the tubal corner of the uterus. This procedure is often performed at the time of hysterectomy for both benign and malignant gynecologic conditions. In the absence of a diseased fallopian tube this is called an opportunistic salpingectomy (OS). OS may also be performed at the time of cesarean section; as a standalone procedure for sterilization; replacing the traditional tubal ligation (TL); or at the time of vaginal hysterectomy.

A few studies have addressed the question of safety of OS and concluded that both peri- and postoperative outcomes with or without the addition of OS were similar with rare adverse events.[24] McAlpine et al. showed that the added operative time was minimal, with a mean of 16 min when added to hysterectomy and 10 min additional time when compared to TL.[25] Moreover, there was no difference in estimated blood loss in the rate of conversion from laparoscopy to open, or in length of hospitalization.[25]

Another concern is that salpingectomy could affect the ovarian reserve since the ovaries and the fallopian tubes partially share the same blood supply.[24] When examining hormonal status after hysterectomy with or without OS, no clinically relevant differences were found.[26] A meta-analysis of studies among women opting for assisted reproductive technologies investigated the effect of salpingectomy on ovarian reserve and (for reasons other than ectopic pregnancy) found no differences.[27] When looking at AMH levels, it was found that the postoperative change in AMH can vary from a substantial decrease to even a slight increase.[28]

In relation to cost-effectiveness, up-front risk-reducing SO carries the lowest cost and highest life expectancy; however, the value of quality of life is challenging to measure. Few studies have demonstrated the cost-effectiveness of OS over hysterectomy alone or in comparison to TL. Subramaniam et al. conducted a cost-effectiveness analysis using decision modeling to compare opportunistic salpingectomy to TL at the time of cesarean section using probabilities of procedure completion, and concluded that in women undergoing cesarean section with sterilization, OS is likely cost-effective and may be cost-effective in comparison to TL for ovarian cancer risk reduction.[29] Kwon et al. examined a Markov Monte Carlo simulation model and estimated the costs and benefits of OS in a hypothetical cohort of women undergoing hysterectomy for benign gynecologic conditions or surgical sterilization. Salpingectomy with hysterectomy was less costly than

hysterectomy alone or with BSO but more effective. For surgical sterilization, salpingectomy was more costly than TL but more effective.[30]

4 | CURRENT LANDSCAPE

With the accumulating data, the two-stage approach, early salpingectomy with delayed oophorectomy as an alternative to risk-reducing BSO, is gaining popularity among high-risk women. In a study conducted on 293 BRCA carriers, more than half of the women who had yet to undergo risk-reducing surgery reported interest in having salpingectomy with delayed oophorectomy.[31] As mentioned previously, most ovarian cancer cases arise in the average-risk population, raising the question of what population measures should be offered. In a retrospective analysis ~20% of ovarian cancer patients had previously had a hysterectomy and 10%–15% had previously had a TL,[32] which makes you wonder whether some of those cases could have been prevented.

Hysterectomy and TL are two common gynecologic surgeries in which the fallopian tubes have usually been left in place in premenopausal women. Currently, it is well accepted to offer OS to all women undergoing hysterectomy for benign indications or seeking sterilization. The addition/change to OS is discussed with the provision of a clear overview of current evidence of benefits and risks and this approach has become the standard of care. Another consideration given the emerging evidence on the potential benefit of OS, is whether women undergoing unrelated abdominal or pelvic surgery should also be offered prophylactic OS once fertility is not pursued.

In a pilot study conducted in Austria, women over 45 who were scheduled for laparoscopic cholecystectomy were interviewed to understand potential concerns and acceptance of concomitant salpingectomy. The results suggest that most of the enrolled women were open to the possibility of concomitant salpingectomy.[33] Following this pilot study, a feasibility study was conducted during which women undergoing planned cholecystectomy were offered OS. A total of 105 patients were included in the study. The rate of acceptance of salpingectomy was approximately in 60% of women. Salpingectomy was performed in 98 of 105 laparoscopic cholecystectomies (93.3%) and not accomplished because of poor visibility or adhesions in seven (6.7%). Median additional operating time was 13 (range: 4–45) min. There were no complications attributable to salpingectomy. One patient presented with ovarian cancer 28 months after prophylactic salpingectomy; histologic re-evaluation of the tubes showed a previously undetected, focal serous tubal intraepithelial carcinoma.[34]

5 | IMPLEMENTATION CHALLENGES

Clearly, removing reproductive organs in women undergoing other surgical procedures will require careful and comprehensive counseling and informed consent. Women must be consulted about the rationale for the added procedure and the possible benefits, about the difference between the function of the fallopian tubes as opposed to the ovaries, and informed that salpingectomy means definitive sterilization but would not result in onset of menopause. Women must be informed about the possible additional operative risks, about the elective nature of the procedure, and about any additional costs.

With the guidance of the gynecology team, surgeons in other disciplines will need to be trained to perform salpingectomy and understand the implications and the risks involved in order to obtain valid consent from the patient, bearing in mind this is a significant cost-effective strategy to prevent ovarian cancer among average-risk women.[35]

Although salpingectomy at the time of gynecologic surgeries carries low risk, the risks may be greater when OS is performed with upper abdomen laparoscopies. Careful judgment would be required regarding when not to pursue salpingectomy; for example, in a woman with previous extensive/multiple pelvic surgeries, background of severe endometriosis, diverticulitis, or if intraoperative evaluations suggest pelvic adhesions and poor visualization or approach to the fallopian tubes.

To conclude, as BSO remains the standard of care to reduce ovarian cancer incidence in high-risk patients, FIGO (the International Federation of Gynecology & Obstetrics) firmly supports opportunistic salpingectomy. This has become an important cancer-risk-reducing strategy for average-risk women who have completed their families and are undergoing abdominal or pelvic surgery. Non-gynecologic surgical subspecialties have an opportunity to contribute to the decrease in incidence of such a lethal disease and save lives by introducing OS in surgical practice where appropriate, in collaboration with gynecologic specialists for the purpose of training and patient counseling.

AUTHOR CONTRIBUTIONS

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CONFLICT OF INTEREST STATEMENT

All co-authors are members of the FIGO Committee on Women's Cancer, with the exception of Danielle Mor-Hadar. The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

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