

# Hysterectomy for benign conditions: Prophylactic oophorectomy or ovary conservation

## Editorial

Hysterectomy is one of the most common gynecologic surgeries. More than 600,000 hysterectomies are performed annually in the United States for benign disease.<sup>1</sup> Prophylactic bilateral oophorectomy is done concomitantly with hysterectomy in 55–80% of cases.<sup>2</sup>

Prophylactic oophorectomy involves removal of the ovaries in addition to hysterectomy. Historically, many gynecologists routinely recommended bilateral salpingo-oophorectomy to all postmenopausal women and suggest it in perimenopausal women, undergoing hysterectomies for benign conditions, to reduce the incidence of ovarian cancer. The apparent reason for this was the belief that hormonal activity of ovaries in postmenopausal women is minimal and removal of the ovaries will be beneficial as a preventive measure for ovarian cancer.

Prophylactic oophorectomy to prevent benign disease, such as fibromyomas, uterine prolapse, pelvic pain or endometriosis, can be regarded as an addition to the surgery which involves no extra time, cost or risk. Removal of both ovaries as a preventive measure for ovarian cancer appeared to be simple and effective.

Compared to women with intact reproductive organs, the incidence of oophorectomy after hysterectomy is 9.2% higher at 30-year follow-up.<sup>3</sup> Conserved ovaries after hysterectomy commonly become cystic, develop residual ovary syndrome with severe pelvic pain, or other benign pathology that require repeat surgery, which mostly is difficult to perform due to firmly adherent ovaries to the pelvic side wall, bowels or urinary bladder. Removal of residual adherent ovaries carries high risk of urethral injury, which is reported to be at least 30%.<sup>4</sup>

In hysterectomies to treat benign conditions, removing both of the ovaries in addition to the fallopian tubes has been used as a way to reduce ovarian cancer risk, although only few patients meet the high-risk criteria for developing ovarian cancer: prophylactic oophorectomy at age >40 and >45 would have prevented 5.2% and 3.3% of ovarian cancer, respectively.<sup>5,6</sup> Prophylactic oophorectomy at the time of hysterectomy for benign gynecologic diseases has been proven to be helpful as a preventive measure for ovarian cancer, but it would be considered risk-reducing, not elective,<sup>7,8</sup> because it is clear that a small fraction of such women will subsequently develop primary peritoneal carcinoma.<sup>9</sup>

The majority of cases with ovarian cancer are sporadic, not hereditary. Women with no documented germ line mutation or family history suspicious for genetic risk for ovarian cancer are considered to be at average risk. Women at increased genetic risk for ovarian cancer, especially those with BRCA1 and BRCA2 germ line mutations are at high risk of ovarian cancer and Lynch syndrome, and it is preferred to undergo risk-reducing bilateral salpingo-oophorectomy.<sup>10</sup>

Several studies suggest a generally negative health effect when prophylactic bilateral salpingo-oophorectomy is performed before the age of menopause. Bilateral oophorectomy causes immediate

drop in hormone levels of ovary that may affect long-term health. Women undergoing bilateral oophorectomy experience vaginal dryness, dyspareunia and loss of libido as a result of abrupt decline in circulating estrogen and testosterone levels.<sup>11</sup> Normally, for many years after menopause ovaries continue to produce androgens which are converted to estrogen peripherally. Negative health consequences after prophylactic oophorectomy include increased risk of death, total cancer mortality, neurologic high blood pressure, high cholesterol, higher incidence of heart disease, stroke, all-cause mortality, premature death, pre-diabetes, and weight gain postoperatively.<sup>12-17</sup> Ovarian conservation in premenopausal women may be important especially in patients with a personal or family history of cardiovascular disease or cognitive impairment. There are conflicting results about hip fracture, quality of life and sexual function, because evaluation of these areas is complex, and depend on numerous factors (Table 1).

Whether to perform bilateral oophorectomy at the time of hysterectomy for benign disease has long been debated. For women without a strong family history of ovarian cancer or genetic predisposition to it, heart disease and death risks appear to outweigh the benefit of the decreased cancer risk, because among women in the U.S., ovarian cancer kills 14,700 women a year, but heart disease kills nearly 327,000 women and stroke, nearly 87,000<sup>18</sup> Culliner<sup>19</sup> first raised questions about the use of incidental bilateral oophorectomy at the time of hysterectomy for benign conditions a half-century ago, citing “an endocrine imbalance that cannot be corrected artificially, cardiovascular effects and osteoporosis”.

However, it was also shown that premenopausal women who undergo a hysterectomy are more likely to enter menopause after the surgery and that the onset of menopause is also advanced.<sup>20</sup> Some studies suggests that ovarian preservation during hysterectomy may not avoid ovarian failure and some women suffer from a postoperative increase in follicle stimulating hormone levels, resulting from decreased estradiol and progesterone feedback.<sup>21</sup> Disruption of ovarian blood flow after hysterectomy may modify ovarian function, which could lead to adnexal pathology. It is estimated that the women who had hysterectomy became menopausal 1.9 years earlier, because

Volume 5 Issue 1 - 2016

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**Received:** August 19, 2016 | **Published:** August 25, 2016

surgery may lead to ovarian damage.<sup>22-25</sup> On the other hand, it has been reported that individuals at increased hereditary risk developed primary peritoneal carcinoma indistinguishable from ovarian cancer or widespread intra-abdominal carcinomatosis, which mimics metastatic ovarian serous carcinoma, following oophorectomy.<sup>26</sup>

**Table 1** Clinical and biochemical variables of individuals with overweight-obesity

Oophorectomy (vs Ovarian conservation) <sup>18</sup>	
Risk	Factor Multivariate-Adjusted HR (95% CI)
CHD (Fatal and Nonfatal)	1.17 (1.02-1.35)
Breast Cancer	0.75 (0.68-0.84)
Lung Cancer	1.26 (1.02-1.56)
Ovarian Cancer	0.04 (0.01-0.09)
Total Cancer	0.90 (0.84-0.96)
Total Cancer Mortality	1.17 (1.04-1.32)
All-Cause Mortality	1.12 (1.03-1.21)

SD: Standard Deviation; BMI: Body Mass Index; WC: Waist Circumference; AC: Abdominal Circumference; HC: Hip Circumference; RER: Respiratory Exchange Ratio; HR: Hazard Ratio.

## Conclusion

Prophylactic bilateral oophorectomy during hysterectomy for benign conditions in a premenopausal woman with sufficient ovarian reserve is still subject to debate. Women of all age groups should be thoroughly counseled regarding the risks and benefits of ovarian preservation. In women age 40 or older, with a history of familial ovarian cancer, bilateral oophorectomy may result in a significant decrease in the death rate from ovarian cancer. For women at average risk of ovarian cancer, the decision to perform prophylactic bilateral salpingo-oophorectomy should be individualized, because this may cause sudden hormonal imbalance, aggravation of menopausal symptoms, and decrease in libido. Ovarian conservation in young women may be especially important in patients with a personal or strong family history of cardiovascular or neurological disease. Negative effects of ovarian hormone deficiency in these women outweigh the beneficial effects on ovarian cancer. If ovaries would be preserved, it is important to protect the ovarian blood supply as much as possible while performing hysterectomy, because ovaries may be damaged. Ovarian conservation until age 65 may benefit long-term survival and it would be advisable to offer prophylactic oophorectomy only to women older than 65 years, who are undergoing hysterectomy for benign disease.

## Acknowledgments

None.

## Conflicts of interest

None.

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