

The Predicted Benefit of Bilateral Salpingo-Oophorectomy in Women who carry a *BRCA1* or *BRCA2* mutation, according to Age of Surgery

Vasily Giannakeas

Abstract

Women with a *BRCA1* or *BRCA2* mutation face a high lifetime risk of ovarian cancer that has been estimated to be approximately 40% for *BRCA1* carriers and 20% for *BRCA2* carriers. To prevent ovarian cancer, these women are advised to undergo preventive surgery (bilateral salpingo-oophorectomy (BSO)) before cancer develops. The recommended age is now 35 for *BRCA1* carriers and 45 for *BRCA2* carriers. In order to avoid premature menopause and/or preserve fertility, some women chose to delay the surgery until the age of menopause. Further, there is no standard upper age at which the surgery is no longer advised, and for older women, the choice of surgery depends on her residual lifetime cancer risk, comorbidity and her life expectancy. To update the information on ovarian cancer risk and to estimate the expected benefit of BSO, we followed a cohort of 5,713 women (4,286 *BRCA1* carriers and 1,427 *BRCA2* carriers) from age 30 (or date of enrollment) to estimate the cumulative risk of ovarian cancer for women with two ovaries intact. Using the Kaplan-Meier method we estimated the actuarial risk of ovarian cancer from age 30 to age 80 to be 56.8% for *BRCA1* carriers and 25.4% for *BRCA2* carriers. We also estimated the lifetime residual risk of cancer for women in a simulated cohort using these annual risks of ovarian cancer and applying other (competing) causes of death from age 30 on. For *BRCA1* carriers who had surgery at age 50 compared to age 35, the additional cancer risk imputed was 23.6%. For healthy women at age 75, the lifetime residual risk of ovarian cancer was estimated to be 11.9%. In conclusion, we found the residual risk of ovarian cancer for healthy older women to be sufficient to consider preventive surgery. We also found a significant risk for *BRCA1* carriers who held off the surgery until age 50.