Editorial

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Cost-effective *BRCA* Testing in Advanced Ovarian Cancer

Ovarian cancer is the most aggressive gynecological cancer worldwide [1]. Because of the deficiency in early detection procedures and rapid progression of the disease, more than 70% of ovarian cancer patients are only diagnosed at an advanced stage. In Korea, the incidence of ovarian cancer has gradually increased, partly due to the westernization of lifestyle and changes in reproductive factors, including early menarche, late menopause, delay in marriage, lower fertility rate in life, and changes in infant feeding patterns [2, 3]. Ovarian cancer is the most common cause of gynecological cancer-related deaths in Korea [4]. Despite advances in treatment over the past few decades, the 5-year survival rate remains below 40% [5]. Most recently, targeted agents, such as poly (ADP-ribose) polymerase (PARP) inhibitors, have driven improvement. PARP inhibitors were the first approved cancer drugs to specifically target the DNA damage response in *BRCA1/2*-mutated breast and ovarian cancers [6]. Since their introduction, the significance of *BRCA* mutations, not only for identifying hereditary breast and ovarian cancer syndromes but also for selecting patients suitable for targeted cancer therapy, has been greatly emphasized [7, 8].

Two types of samples can be used for *BRCA* testing: germline and somatic samples. Germline *BRCA* mutations are analyzed in peripheral blood samples, whereas somatic mutations are detected in tumor samples. In comparison with the analysis of DNA isolated from blood samples, testing DNA isolated from formalin-fixed paraffin-embedded (FFPE) tissue is challenging because various factors, such as FFPE age, DNA fragmentation, and deamination, can reduce specimen integrity [9, 10]. Although *BRCA* testing using both samples is beneficial for ovarian cancer patients, because of the limited resources, it is desirable to develop an optimal *BRCA* testing strategy based on economic evaluation.

This issue was addressed in a recent study by Jang, *et al.* [11]. They assessed the cost-effectiveness of *BRCA* testing strategies followed by PARP inhibitor maintenance therapy based on the National Health Insurance system in Korea. They evaluated five *BRCA* testing strategies: (1) germline testing first, followed by somatic tumor testing for patients without germline mutations; (2) somatic testing first, followed by germline testing for patients with mutations detected by somatic testing; (3) both germline and somatic testing; (4) germline testing alone; and (5) somatic testing alone. By analyzing the incremental cost-effectiveness ratio, the authors found that all five strategies were cost-effective. Strategy 4 was the most cost-effective option, with an incremental cost-effectiveness ratio, followed by strategy 1. They concluded that germline testing first, followed by somatic testing, may be a reasonable *BRCA* testing option for Korean patients with advanced ovarian cancer. This study provides important and valuable information for clinicians, clinical laboratories, and the government to consider and plan *BRCA* testing strategies for advanced ovarian cancer in the targeted cancer therapy era.

AUTHOR CONTRIBUTIONS

Kim M accepts responsibility for the content of this manuscript and approved its submission.

CONFLICTS OF INTEREST

No potential conflicts of interest relevant to this paper were reported.

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