

Viewpoint

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Prophylactic Mastectomy and Salpingo-Oophorectomy: Ethics and Policy

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Abstract

Breast cancer is the most common cancer and the fifth most common cause of death from cancer in women. Ovarian cancer is the deadliest type of the gynecological cancers. Concerning women with BRCA1 or BRCA2 mutation, surgical alternatives for reducing their risk of developing breast and/or ovarian cancer are prophylactic mastectomy, skin-sparing mastectomy, and prophylactic salpingo-oophorectomy. The arguments of the proponents and opponents regarding prophylactic mastectomy and salpingo-oophorectomy are presented. Prophylactic surgeries are controversial; hence, mandating immediate interventions on the policy level.

Keywords: Mastectomy, Salpingo-oophorectomy, Opponents, Proponents, Policy

Introduction

Prophylactic surgeries reduce the risk of cancer development in healthy women.¹⁻³ Breast cancer is highly prevalent among women and the fifth cause of death from cancer.¹⁻⁴ Each year, there are 69,500 new cases and 17,000 mortalities associated with breast cancer,² which is either sporadic or hereditary.^{1,3} At the age of 64, women at risk commonly contract sporadic breast cancer.^{1,2} Regarding the hereditary kind, women with the BRCA1 mutation contract breast cancer at the age of

44, and those with the BRCA2 mutation contract the disease at the age of 47, which is relatively young.^{1,2}

Of the gynecological cancers, ovarian cancer causes more deaths in women who contract the disease.⁵ Surgical alternatives for reducing the risk of breast or ovarian cancer are prophylactic mastectomy, skin-sparing mastectomy, and risk-reducing (prophylactic) salpingo-oophorectomy.^{1,3,5,6}

In May 2013, Angelina Jolie revealed that she had undergone a

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preventive double mastectomy because she had a family history of breast cancer, carrying the mutation of the BRCA1 gene.⁷ After two years, she announced that she had undergone a laparoscopic oophorectomy.⁸ Since then, there has been widespread legal and ethical debates regarding prophylactic surgeries to prevent or reduce the risk of developing breast/ovarian cancer.

This paper presents the arguments of the proponents and opponents regarding prophylactic mastectomy and salpingo-oophorectomy. A policy on the national level should be developed and promoted concerning prophylactic mastectomy and salpingo-oophorectomy, taking into consideration the rising number of breast and/or ovarian cancer.

Background

After Angelina Jolie's announcement as to her BRCA1 gene mutation, there has been an increase in the global awareness about the genetic mutations associated with breast and ovarian cancers.⁹ The rising number of women with genetic mutations has doubled their risk of developing breast cancer.^{1,10}

Women with no family history of breast or ovarian cancer and no BRCA1 or BRCA2 mutation are considered run an average risk of ovarian cancer.^{1,5} Those with BRCA1 or BRCA2 mutation are considered to be at a high risk for ovarian cancer. Women who have a strong family history of either breast or ovarian cancer are considered to be at higher than average risk.^{1,5,11}

After cardiovascular diseases, cancer is the second leading cause of death in Jordan,¹² which is expected to increase as the population is aging with a longer life expectancy. Cancer care in Jordan focuses on secondary treatment, while less effort is placed on the primary level of cancer care.¹² Jordan does not have a national cancer control plan except that of 2014. Cancer control programs should be developed and maintained in Jordan so as to help lessen the burden of cancer and improve treatment outcomes.¹² This ultimately supports the need for developing a national cancer-

related policy rather than having scattered initiatives.

There is no published work in Jordan regarding inherited cancers such as hereditary breast and/or ovarian cancer associated with BRCA1 or BRCA2 mutation;¹² however, there are ongoing studies pertaining to the prevalence of BRCA1 or BRCA2 mutation in high-risk breast cancer patients.¹² Researchers have reported that lung cancer is the most prevalent cause of death in males (30.2%), followed by colorectal (10.3%) and prostate cancers (6.2%). Breast cancer is the most common cause of death in females (22.4%), followed by colorectal (8.9%) and lung cancers (7.0%). However, researchers have reported their concerns about the accuracy of the data reported by the Jordan Cancer Registry.

Prophylactic mastectomy refers to the surgical removal of healthy breast or breasts.^{1,3} Its types are simple, subcutaneous, and total skin-sparing mastectomy.¹ This surgery is performed in BRCA1 or BRCA2 mutation carriers without breast cancer.¹⁻³ If the genetic testing reveals a positive BRCA1 or BRCA2 mutation, the woman can choose to have regular screening or undergo risk-reducing surgical methods such as bilateral prophylactic mastectomy. As regards BRCA1 or BRCA2 mutation with already developed breast cancer, a contralateral prophylactic mastectomy is done to reduce the risk of contralateral breast cancer.¹⁻³ Concerning BRCA1 or BRCA2 mutation carriers with no developed breast cancer, bilateral prophylactic mastectomy is done as a form of primary prevention to prevent breast cancer from developing in the first place.^{1,3} Bilateral prophylactic mastectomy reduces the risk of breast cancer by more than 90%.²

Prophylactic salpingo-oophorectomy refers to the surgical removal of healthy fallopian tubes and ovaries in women who have an increased risk of ovarian, fallopian tube, or breast cancers.^{1,5,13} Prophylactic salpingo-oophorectomy is recommended for women with inherited BRCA1 or BRCA2 mutation, a history of breast or gynecological cancers, and/or strong family history of breast or ovarian cancers.^{1,5,14} Prophylactic salpingo-oophorectomy reduces the

risk of ovarian or fallopian tube cancer by 85%-90% and breast cancer by 40%-70%.^{1,3,5,15,16}

While salpingo-oophorectomy has no major complications for postmenopausal women, it may have a negative impact on premenopausal women due to the sudden loss of natural sex hormones, especially estrogen. This may significantly increase the risk of serious health conditions such as osteoporosis and cardiovascular diseases; however, post-salpingo-oophorectomy estrogen therapy reduces the risk of these complications.^{1,3,5,15,17}

For women running a high risk of ovarian cancer, counseling is performed to determine whether prophylactic surgery is necessary.¹⁸ An expert gynecologic oncologist and a genetic counselor should present the benefits and complications associated with salpingo-oophorectomy while respecting women's autonomous decision-making regarding the surgery.^{1,3,5,18}

An Ethical Argumentation

Proponents of Prophylactic Mastectomy

In women with BRCA1 or BRCA2 mutation, prophylactic mastectomy reduces the risk of breast cancer by up to 90%.^{1-3,19} In women with both breast cancer and a family history of breast cancer, prophylactic mastectomy reduces the risk of developing cancer in the other breast by up to 95%.^{1-3,19}

Proponents of Prophylactic Salpingo-Oophorectomy

The overall survival is longer with prophylactic salpingo-oophorectomy (HR 0.32, 95% CI 0.19 to 0.54; $P < 0.001$).¹ Regarding the risk of ovarian cancer, women who underwent prophylactic salpingo-oophorectomy differed significantly from those who did not (MD 15.40, 95% CI 8.76 to 22.04; $P < 0.00001$).¹

Prophylactic salpingo-oophorectomy is an ethical procedure discussed by Collins (2015)²⁰ using "the morality of human acts" principle, which divides human actions into three elements to define its morality: the selected object, the end in view, and the surrounding circumstances. Salpingo-oophorectomy is divided into 1) the

object (the surgical removal of healthy, non-vital ovaries, which seriously threatens women at a high-risk of developing cancer) which is good, justified under the principles of integrity and totality; 2) the intention to reduce the threat, which is good; and 3) the foreseen but unintended secondary effect of sterility, which is not good.²⁰ The good effect is not brought about by the bad effect, rather there is no superior alternative.²⁰

Eisinger (2007)²¹ and Stan et al. (2013)¹⁸ focused on the principle of "autonomy in decision-making" regarding salpingo-oophorectomy after comprehensively explaining all benefits and complications of the surgery for women. Under these terms, salpingo-oophorectomy is ultimately an ethical procedure.^{1-3,18,21}

According to the Society of Gynecologic Oncology (2008), salpingo-oophorectomy is highly recommended for women at a high risk of developing ovarian cancer, especially in the age range of 35-40 years.²² Moreover, the American College of Obstetricians and Gynecologists (ACOG) (2008) highly recommends salpingo-oophorectomy at the time of hysterectomy for postmenopausal women running a high risk of ovarian cancer.²² The Japan Society of Gynecologic Oncology recommends that salpingo-oophorectomy for a woman with BRCA1 or BRCA2 mutation only be performed by a gynecologic oncologist after consulting with a clinical geneticist and a pathologist and after the approval of the surgery by the institutional ethics committee.²³ In 2013, the US Supreme Court invalidated the BRCA gene patents held by Myriad Genetics, which led to a significant reduction in the cost of genetic testing which was not accessible to all women.²⁴

Opponents of Prophylactic Mastectomy

Prophylactic mastectomy has little or no effect on the survival of women with cancer in one breast, yet no strong family history of breast cancer nor a genetic mutation.¹⁻³ For women with an average risk, prophylactic mastectomy may increase the risks of surgical complications, such as bleeding, infection, pain, anxiety, or disappointment concerning the changes in their

appearance, and/or complications arising from breast reconstruction such as the inability to experience sexual feelings in the breasts and the loss of libido.¹⁻³

Opponents of Prophylactic Salpingo-Oophorectomy

Juarez and his colleagues (2007)²⁵ considered salpingo-oophorectomy as an unethical procedure because it could violate the Hippocratic Oath, based on which physicians are committed to protect their patients from harm; this obligation may be questionable during consultation or the performance of salpingo-oophorectomy. On the other hand, the fear of contracting breast/ovarian cancer causes vulnerability in women, influencing their ability to decide on salpingo-oophorectomy. Furthermore, there is no guarantee that those who undergo surgery will ever develop breast cancer.^{1-3,18,25}

From Islamic perspectives, Muhammad Al-Munajjid (Founder of IslamQA.info fatwa website) was asked about the contralateral prophylactic mastectomy. He said "It is not permissible to amputate a healthy limb because of a suspicion that it may become diseased in the future, as this is a form of transgression against which Allah (God) has created and is not necessary".²⁶

In summary, prophylactic surgeries are controversial, and there exist different viewpoints of proponents and opponents presented here. Such controversy involves the probability of developing cancer, the benefits as compared to the complications of these surgeries, and patients' autonomy.

Current Authors' Position

Current authors are for performing prophylactic mastectomy and/or salpingo-oophorectomy in women who are at a high-risk of developing breast/ovarian cancer. Mastectomy does entail certain complications such as anxiety and pain which can be controlled by visiting an expert oncologist.

Salpingo-oophorectomy causes infertility and has ensues complications; however, it has a significant impact on reducing the probability of

developing breast/ovarian cancer among high-risk women. Salpingo-oophorectomy is an ethical procedure because it aims at protecting women's lives from deadly cancers. As Muslims, the current authors hold that there is no discrepancy between faith in God and prophylactic mastectomy and/or salpingo-oophorectomy because our religion encourages us to take preventive measures against diseases.

A comprehensive assessment must be performed by a multidisciplinary team for women at risk so as to help them make autonomous decisions.

Implications for Nursing: A Policy Matter

To help unify and standardize the diagnostic approach for breast cancer, the Jordan Breast Cancer Program developed breast cancer screening and diagnosis guidelines,¹² none of which focuses on prophylactic mastectomy and/or salpingo-oophorectomy in high-risk women.

In Jordan, the following recommendations can help establish a national policy about the use of prophylactic mastectomy and/or salpingo-oophorectomy to reduce the risk of breast and ovarian cancers in women:

- Enhance the role of media to raise public awareness as to genetic testing.
- Increase the social awareness regarding the role of prophylactic surgeries in reducing the risk of breast/ovarian cancer in women with BRAC1 or BRAC2 mutation.
- Initiate counselling services for high-risk women to help them decide on whether to undergo prophylactic mastectomy and/or salpingo-oophorectomy.
- Develop educational and training programs for all healthcare providers concerning genetic testing and cancer prevention and management.
- Encourage researchers to conduct studies that identify the incidence of gene mutations associated with breast/ovarian cancer, especially BRCA1 or BRAC2 mutation.

Summary and Conclusions

Prophylactic surgeries are still controversial

and the purpose of this paper was to present the arguments of the proponents and opponents regarding prophylactic mastectomy and salpingo-oophorectomy. There are various benefits and complications in both surgeries, which should be balanced for the benefit of women at a high risk of developing breast/ovarian cancer.

Prophylactic mastectomy decreases the risk of breast cancer in women with BRAC1 or BRAC2 mutation; these women may live longer than those who did not undergo the procedure; however, prophylactic mastectomy can also increase the levels of post-surgery anxiety, depression, and dissatisfaction.

Prophylactic salpingo-oophorectomy leads to certain complications, especially for the premenopausal women; however, this should not overshadow the major benefits of this surgery, while keeping in mind the lack of effective screening tools for the ovarian cancer and the high incidence of morbidity and mortality associated with this cancer.

Conflict of Interest

None declared.

References

1. Eleje GU, Eke AC, Ezebialu IU, Ikechebelu JI, Ugwu EO, Okonkwo OO. Risk-reducing bilateral salpingo-oophorectomy in women with BRCA1 or BRCA2 mutations. *Cochrane Database Syst Rev.* 2018; 8:CD012464. doi:10.1002/14651858.CD012464. pub2.
2. Mau C, Untch M. Prophylactic surgery: For whom, when and how? *Breast Care (Basel).* 2017;12(6):379-84. doi: 10.1159/000485830.
3. Song CV, Teo SH, Taib NA, Yip CH. Surgery for BRCA, TP53 and PALB2: A literature review. *Ecan-cermedicalscience.* 2018;12:863. doi:10.3332/ecancer.2018.863.
4. Torre LA, Siegel RL, Ward EM, Jemal A. Global cancer incidence and mortality rates and trends—an update. *Cancer Epidemiol Biomarkers Prev.* 2016;25(1):16-27. doi:10.1158/1055-9965.EPI-15-0578.
5. Gottschau M, Mellekjaer L, Hannibal CG, Kjaer SK. Ovarian and tubal cancer in Denmark: An update on incidence and survival. *Acta Obstet Gynecol Scand.* 2016;95(10):1181-9. doi: 10.1111/aogs.12948.
6. Costa M, Saldanha P. Risk reduction strategies in breast cancer prevention. *Eur J Breast Health.* 2017;13(3):103. doi 10.5152/ejbh.2017.3583.
7. Jolie A [Internet]. My medical choice. The New York Times; 2013;14(05) [cited on: 2019 July 9]. Available from: http://www.nytimes.com/2013/05/14/opinion/my-medical-choice.html?_r=0.
8. Jolie, A. [Internet]. Angelina Jolie Pitt: Diary of a surgery. The New York Times; 2013;24:A23 [cited on: 2019 July 9]. Available from: <http://nyti.ms/1OugzvD>.
9. Kluger J, Park A. The Angelina effect. *Time.* 2013;181(20):28-33.
10. Hagan K. [Internet]. Breast cancer genetic testing soars after Angelina Jolie's double mastectomy. The Sydney Morning Herald;2013 [cited on: 2019 July 9]. Available from: <https://www.smh.com.au/healthcare/breast-cancer-genetic-testing-soars-after-angelina-jolies-double-mastectomy-20131112-2xelm.html>.
11. Berek JS, Chalas E, Edelson M, Moore DH, Burke WM, Cliby WA. Prophylactic and risk-reducing bilateral salpingo-oophorectomy: Recommendations based on risk of ovarian cancer. *Obstet Gynecol.* 2010;116(3):733-43. doi: 10.1097/AOG.0b013e3181ec5fc1.
12. Abdel-Razeq H, Attiga F, Mansour A. Cancer care in Jordan. *Hematol Oncol Stem Cell Ther.* 2015;8(2):64-70. doi: 10.1016/j.hemonc.2015.02.001.
13. Rebbeck TR, Kauff ND, Domchek SM. Meta-analysis of risk reduction estimates associated with risk-reducing salpingo-oophorectomy in BRCA1 or BRCA2 mutation carriers. *J Natl Cancer Inst.* 2009;101(2):80-87. doi: 10.1093/jnci/djn442.
14. Paluch-Shimon S, Cardoso F, Sessa C, Balmana J, Cardoso MJ, Gilbert F, et al. Prevention and screening in BRCA mutation carriers and other breast/ovarian hereditary cancer syndromes: ESMO clinical practice guidelines for cancer prevention and screening. *Ann Oncol.* 2016;27(Suppl 5):v103-v110. doi: 10.1093/annonc/mdw327.
15. Finch AP, Lubinski J, Moller P, Singer CF, Karlan B, Senter L, et al. Impact of oophorectomy on cancer incidence and mortality in women with a BRCA1 or BRCA2 mutation. *J Clin Oncol.* 2014;32(15):1547-53. doi: 10.1200/JCO.2013.53.2820.
16. Shoni M, May T, Vitonis AF, Garza A, Muto MG, Feltmate CM. Laparoscopic risk-reducing salpingo-oophorectomy: The Brigham and women's experience. *ISRN Minim Invasive Surg.* 2012;2012. doi:10.5402/2012/763290.
17. Erekson EA, Martin DK, Ratner ES. Oophorectomy: The debate between ovarian conservation and elective oophorectomy. *Menopause (New York, NY).* 2013;20(1):110-14. doi: 10.1097/gme.0b013e31825a27ab.
18. Stan DL, Shuster LT, Wick MJ, Swanson CL, Pruthi S, Bakkum-Gamez JN. Challenging and complex decisions in the management of the BRCA mutation

- carrier. *J Womens Health*. 2013;22(10):825-34. doi: 10.1089/jwh.2013.4407.
19. De Felice F, Marchetti C, Musella A, Palaia I, Perniola G, Musio D, et al. Bilateral risk-reduction mastectomy in BRCA1 and BRCA2 mutation carriers: A metaanalysis. *Ann Surg Oncol*. 2015;22(9):2876-80. doi: 10.1245/s10434-015-4532-1.
 20. Collins TP. On the morality of risk-reducing surgery. *Natl Cathol Bioeth Q*. 2015;15(1):75-89.
 21. Eisinger F. Prophylactic mastectomy: Ethical issues. *Br Med Bull*. 2007;81(1):7-19. doi: 10.1093/bmb/ldm003.
 22. Walker JL, Powell CB, Chen LM, Carter J, Bae Jump VL, Parker LP, et al. Society of Gynecologic Oncology recommendations for the prevention of ovarian cancer. *Cancer*. 2015;121(13):2108-20. doi: 10.1002/cncr.29321.
 23. Komiyama S, Katabuchi H, Mikami M, Nagase S, Okamoto A, Ito K, et al. Japan Society of Gynecologic Oncology guidelines 2015 for the treatment of ovarian cancer including primary peritoneal cancer and fallopian tube cancer. *Int J Clin Oncol*. 2016;21(3):435-46. doi:10.1007/s10147-016-0985-x.
 24. Liptak A. [Internet]. Justices, 9-0, bar patenting human genes. The New York Times. 2013;13 [cited on: 2019 July 9]. Available from: http://www.nytimes.com/2013/06/14/us/supreme-court-rules-human-genes-may-not-be-patented.html?_r=0.
 25. Juarez A, Ramos J, Leony D, Fiscal A. Ethical elements in contemporary health care. *Elizabeth Zubiate*. 2007;1.
 26. Al-Munajjid M. [Internet]. Ruling on removal of a healthy breast out fear of it being affected by cancer after the affected breast was removed. Islam Question and Answer; 2012 [cited on: 2019 July 9]. Available from: <https://islamqa.info/en/180744>.