Information for the Adolescent Woman and Her Parents: Abortion and the Risk of Breast Cancer

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ABSTRACT: Studies from many nations suggest that induced abortion (IA) may be a causal risk factor for the development of breast cancer. Researchers agree that IA contributes to the increased risk of breast cancer by delaying the timing of a full-term pregnancy which is a protective factor. Increasing numbers of studies now show that IA prior to 32 weeks in and of itself is a risk factor for breast cancer due to the physiology of breast development and the manner in which abortion interferes with the maturation of the breast cells. Although largely ignored by the mainstream medical community, this risk information deserves a prominent place in the education of all adolescent women who may, in the future, consider an IA.

Introduction

IA prior to 32 weeks gestation appears to increase a woman's risk of developing breast cancer. This association is largely ignored by the mainstream medical community, not included in sex education programs, and even disputed by some. For example, the Guttmacher Institute claims, "Exhaustive reviews by panels convened by the U.S. and British governments have concluded that there is no association between abortion and breast cancer. There is also no indication that abortion is a risk factor for other cancers."[1] However, as documented by the Breast Cancer Prevention Institute, the vast majority of studies (57 of 73 worldwide) do show a strong association between IA and an increased risk of breast cancer.[2] This discrepancy exists for many reasons, including bias in the selection of articles chosen for "exhaustive review," as well as flaws in methodology (e.g. including spontaneous abortions along with IAs) of some studies that discount the association. As with any medical treatment or recommendation, a lack of 100 percent certainty and the need for constant re-evaluation is not a legitimate rationale for withholding potentially life-threatening information concerning an elective procedure.

Anatomy and Physiology of Breast Development

In order to understand why abortion might contribute to an increased risk of breast cancer, it is crucial for all women to understand the anatomy and physiology of breast development. The breast is composed of three primary tissues – fat, connective, and duct/glandular tissue. The duct system can be compared to a tree with branches. When a female is born, she has a small number of prepubescent or Type 1 lobules that have only a rudimentary duct system – the tree trunk has very few branches. During puberty, young women will develop additional Type 1 lobules, and some of the lobules will mature to pubescent or Type 2 with a slight increase in the duct system – so the tree trunk has many more branches. (The increase in size of the breast during puberty is caused mainly by increased fat cells and connective tissue.) At the end of puberty, a female's breast will contain a mixture of approximately 75 percent Type 1 lobules and 25 percent Type 2 lobules. Type 1 and Type 2 lobules, because of their immaturity, are vulnerable to cancer.

During the first half of a pregnancy, termed the "proliferation phase," Type 1 and Type 2 lobules increase in number due to the influence of estrogen. Within just a few days of conception, a woman's levels of estrogen increase, and by the end of her first trimester, estrogen levels have increased by 2000 percent. By the 20th week of pregnancy, the breast has doubled in volume, mainly because of the increased number of lobules. During the second half of pregnancy, the immature, cancer-vulnerable Type 1 and Type 2 lobules begin to differentiate or mature into Type 4 lobules that are capable of producing milk. After 32 weeks of pregnancy, enough Type 4 lobules have developed to help protect a mother against breast cancer. By 40 weeks, 85 percent of a female's lobules are of the relatively more cancer-resistant, mature Type 4 lobules.

The microbiology of breast development is still being investigated and the differentiation from Type 2 to Type 3 and 4 lobules is not yet fully explained. It is known that after birth, with or without lactation, the

Type 4 lobules regress to Type 3, but importantly, via epigenetics, these cells maintain the changes that protect them from susceptibility to cancer.

Risk Factors for Breast Cancer

It is an accepted fact by all researchers that the immature breast cells in Type 1 and Type 2 lobules are the cells at greatest risk for the development of cancer. Type 1 lobules are also known as terminal ductal lobular units (TDLUs) where 80 percent of all breast cancers are formed – the in-situ and invasive ductal cancers. Type 2 lobules are where lobular carcinoma (about 15 percent of all breast cancers) are formed. Type 3 and 4 lobules are mature and more resistant to factors that contribute to the development of cancer. Therefore, when a woman has completed at least 32 weeks of pregnancy she will have a lower risk of breast cancer. Conversely, if she never gives birth, her risk will be higher.

If a woman has an IA prior to 32 weeks, her cells have been exposed to the stimulation of estrogen, but have not yet been allowed to fully develop and mature into Type 3 and 4 lobules. The cells have begun to rapidly multiply only to have their hormonal environment dramatically changed when the pregnancy is terminated. This results in more Type 1 and Type 2 lobules (more cells in an undifferentiated state), and therefore more places for cancers to form. The female will also lose the protection she would otherwise have had with a full-term pregnancy and her cells are then harmfully exposed to more estrogen through future menstrual cycles. It is easy to understand from a biological standpoint how an IA may contribute to the risk of breast cancer.

However, a *spontaneous* abortion, also known as a miscarriage, in the first trimester is not associated with an increased risk since the levels of estrogen are not as elevated during the pregnancy and breast tissue growth does not occur to the same degree as in a healthy pregnancy. A miscarriage or still birth in the second trimester does carry a slightly increased risk due to the greater stimulation of Type 1 and Type 2 lobules.

The most important variable for breast cancer is the amount of estrogen to which a woman is exposed without the differentiating (maturing) effect of a full-term pregnancy. Women who start their menstrual cycles at a younger age are at a greater risk, as are those who have later menopause. Women who first give birth after 30 years of age are also at an increased risk because their immature Type 1 and 2 lobules have been exposed to estrogen (and potential carcinogens) for more years before their first pregnancy.

There are other risk factors for breast cancer which include: alcohol (which increases estrogenic exposure by decreasing the liver's ability to clear the estrogen), breast cancer genes (BRCA genes), cigarette smoking (by damaging DNA), and postmenopausal obesity (fat cells make estrogen). Factors that decrease breast cancer risk include breast feeding, having children in young adulthood, early menopause, exercise (by decreasing estrogen exposure), and nutritional factors such as omega-3 fatty acids (which decrease inflammation making conditions less favorable for cancer to form) and cruciferous vegetables (which contain compounds that facilitate estrogen metabolism and removal).

Timing of Abortion Relative to Childbirth and the Risk of Breast Cancer

An IA that occurs before a woman has had a full-term pregnancy interrupts the development of the woman's breast tissue thereby preventing maturation into Type 3 and 4 lobules. This results in more Type 1 and Type 2 lobules remaining in the breasts leading to more undifferentiated cells that are susceptible to carcinogens and estrogenic stimulation in the future. This places the woman at a higher risk for breast cancer development as compared to the woman who has an abortion after having already carried a child to full term. The woman who has previously given birth (after at least 32 weeks) has mature Type 3 and 4 lobules that are more resistant to the development of cancer and her subsequent abortion does not increase her risk as greatly as that of the woman who has never given birth. In 2006, 42 percent of abortions were to women who had never given birth[3] placing them at greater risk for breast cancer than those who have also given birth.

Abortion and Premature Delivery
An IA increases a woman's risk of premature delivery with subsequent pregnancies. During surgical abortions, the cervix is forced open and often injured, and the damage may weaken the cervix resulting in the premature delivery of future pregnancies. The literature documents a woman's risk of premature deliveries increases with the number of abortions—especially the risk of very early premature delivery (less than 28 to 32 weeks).[4] Since premature delivery prior to 32 weeks also increases the risk of breast cancer, IA may further increase a woman's risk by this mechanism.

Dose-Effect Response between Abortion and Breast Cancer
Given the physiology of cancer susceptibility of the breast, it would be expected that the greater the time for Type 1 and 2 lobules to increase, the greater the risk of breast cancer. Studies on abortion and breast cancer are consistent with this expectation. A Danish study which included data on the gestational age at IA demonstrated a three percent increase in the incidence of breast cancer risk per every week gestation at abortion.[5] Additionally, a 2012 Finnish study also documented an increased risk of pre-term delivery with increasing numbers of abortions.[6] Likewise, numerous studies have shown a higher risk for women who have multiple abortions.[7] In 2006, 45 percent of abortions were repeat abortions.[8]

Literature Review of Abortion – Breast Cancer Link
There are serious methodological flaws in abortion-breast cancer literature. The most serious flaw is the inclusion of women who have *spontaneous* first trimester abortions compared with those women who have IAs. Other major flaws include lack of long-term follow-up (since it can take 8 – 10 years for a breast cancer to develop and be identified), inappropriately excluding from the analysis patients with in situ breast cancer,[9] and incorrectly classifying all older women into the no-abortion cohort.[10]

In contrast, an unbiased, quality 2013 meta-analysis of 36 studies revealed a significant increase in risk of breast cancer (OR=1.44 for first IA, 1.76 after second, and 1.89 after third IA) after experiencing an IA.[11]

Increasing Incidence of Breast Cancer
It is important to understand that the incidence of breast cancer is increasing worldwide. In February 2013, Rebecca Johnson, MD, and her colleagues made national news with their research demonstrating an increased incidence of breast cancer with distant involvement (metastatic disease) in young women in 2009 compared with the rates in 1979. Dr. Johnson stated, "In conclusion, SEER (US Surveillance, Epidemiology, and End Results program of the National Cancer Institute) data showed a small but statistically significant increase in the incidence of breast cancer with distant involvement for women aged 25 to 39 years. The trajectory of the incidence trend predicts that an increasing number of young women in the United States will present with metastatic breast cancer in an age group that already has the worst prognosis..."[12]

Epidemiological studies support the role of abortion in this increased incidence of breast cancer. Romania, for instance had one of Europe's lowest rates of breast cancer during the time that abortion was illegal under Ceausescu, whose communist rule ended in 1989. Since the legalization of abortion in Romania in 1989, the numbers of abortions increased over 400 percent and the breast cancer incidence doubled in 18 years from 25 cases per 100,000 women in 1988 to 51 cases per 100,000 women in 2006.[13] The enforcement of the one-child policy in China, which includes forced abortions, has led to an increased incidence of breast cancer rates in that country, with the incidence increasing 31 percent since 1983.[14,15]

Conclusion
Evidence suggests that IA prior to a full-term pregnancy contributes to the high rates of breast cancer seen around the world. The current studies demonstrating a dose-related association between pre-term IA and breast cancer strongly suggest a causal effect. Although further study is warranted, this risk must be known by adolescent females. The American College of Pediatricians recommends that all medical

professionals provide this information as part of complete health care to all adolescents and their parents. It is important that parents reinforce this information to their daughters. All health educators should include this information in any health/sexuality education class in which abortion is discussed.

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The American College of Pediatricians is a national medical association of licensed physicians and healthcare professionals who specialize in the care of infants, children, and adolescents. The mission of the College is to enable all children to reach their optimal, physical, and emotional health and well-being.

Additional information on scientific articles evaluating the abortion–breast cancer link is available at: http://www.bcpinstitute.org/FactSheets/BCPI-FactSheet-Epidemiol-studies.pdf.

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