



The Libyan International Medical University
Faculty of Basic Medical Science



Relation between Breast Cancer and Oral Contraceptives drug

Fatma Ali Al Fatory

Supervised by: Mohamed Hamza

Assisted by: Suzan Mohamed

Report Submitted to fulfill the requirements for Scientific Research Activity

Date of Submission: 12/12/ 2020

Abstract

Oral contraceptives (OCs) use has been linked to increased risk of breast cancer (BC) are a concerning relationship as the incidence of breast cancer in the recent decades have been exponentially increasing around the globe, this occurs in breast tissue and is associated with various risk factors including breast cancer family history, excessive use of breast cancer medications, alcohol consumption, obesity, and elderly people, numerous research studies have shown an increased risk of breast cancer in women using oral contraceptives, especially in women with chronic history of use. Estrogen plays a leadership role in breast cancer pathophysiology.

The aim of this report , we will discuss various research studies on the risk of breast cancer in women taking oral contraceptives, and whether or not birth control pills have a significant impact on breast cancer growth.

Introduction

Breast cancer is uncontrolled growth of abnormal cells in the milk producing breast glands or in the passages (ducts) that carry milk to the nipples is the most common cancer of the breast, many risk factors have been identified for breast cancer, some of the most important risk factors such as age in women over 50 years of age most cases of breast cancer occur, family history if a woman has a family or personal history of breast cancer, the risk of developing breast cancer increases, and additional risk factors: postmenopausal obesity, postmenopausal hormone replacement mammographic density, and alcohol consumption. The risk of Nulliparous and in those who delivered their first child after the age of 30 Pregnancy results in terminal differentiation of milk-producing luminal cells, removing them from the potential pool of cancer precursors. Obesity due to increased synthesis of estrogens in fat depots. Early age of menarche and late age of menopause (long reproductive period). High doses of exogenous estrogens used in the treatment of menopausal symptoms, atypical epithelial hyperplasia of breast. Carcinoma of endometrium of the other breast or functioning ovarian tumors. [1][2]

Genetic and hormonal (then environmental) are the major risk factors for breast cancer development, breast cancer can be divided into: hereditary cases, associated with genetic mutations or sporadic cases, related to hormonal exposure, also breast cancer is classified into three major groups dependent on the expression of hormone receptor estrogen receptor (ER) and progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) expression: 1) Positive ER (negative HER2; 50%–65% of cancers) 2) Negative HER2 (positive or negative ER; 10%–20% of cancers) 3) Triple negative (negative ER, PR and HER2; 10%–20% of cancers), the role of estrogen in BC etiology: Normal breast epithelium has receptors for estrogen and progesterone, Estrogen is responsible for promoting the development of certain factors such as alpha growth factor transition and growth factor derived from platelets, the breast cancer cells secrete these factors and are responsible for the progression of the tumor. always occurs in the left breast > right breast, 50% of cases are from the upper outer quadrant, 20% are periareolar (central) and 10% are from any other quadrant (upper inner, lower inner, lower outer), 90% of cases occur in the ductal epithelium, while 10% occur in mammalian lobules. Another classification of BC into: non-invasive (in situ), invasive, Paget's disease of the nipple. [1]

Oral contraceptives drug is the most common method of contraception among female adolescents ,which is also known as "the pill.", ovulation inhibition is the main mechanism of action. Therefore, oral contraceptives develop an endometrium which is not responsive to ovum implantation and cervical mucus which becomes thick and hostile to sperm transport.The progestin-only pill (minipill) is less effective in preventing abortion than combined oral contraceptives[3][4].Major types of oral contraceptives are Combination oral contraceptives(COCs) containing both an estrogen and a progestin are the most widely used agents in the U.S, and Progestin-Only Contraceptives(POPs) that contain a progestin but do not contain an estrogen , the mechanism of action of (OCPs) estrogen provides a negative feedback on the pituitary gland releasing luteinizing hormone (LH) and follicle-stimulating hormone (FSH), thus preventing ovulation, and the progestin also prevents the release of LH and thickens the cervical mucus thereby, hampering sperm transport. Withdrawal of the progestin during the placebo week induces menstrual bleeding. [3]

There were several major categories of untoward effects of early hormonal contraceptives, adverse cardiovascular effects, including hypertension, myocardial infarction, hemorrhagic or ischemic stroke, venous thrombosis and embolism; breast, hepatocellular, and cervical cancers; and a variety of endocrine and metabolic effects, low-dose formulations pose minimal risks to the health of women without predisposing risk factors.[4]

Materials and Methods

The data was collected by using the information from two articles.

The first study was obtained from the scientific committee at the King Hussein Cancer Center in 2017 in Jordan . Participants information remained confidential within the institution. All women who have been diagnosed with breast cancer (225 case) in between April and November 2017 were approached. Control cases, free of breast cancer were selected from other clinics. Cases and control cases were 450 women in the age category of 18 to 65 years old Jordanian females. The standard written statement in this study included information about history of breast cancer or any other type of cancer, age at first child, duration of breast feeding, abortion, menopause, smoking and physical activity. [6]

The participants were asked to provide detailed information about the use of OCs or any other hormonal replacement therapy (demographic data were also obtained).

The second study was performed at the National Cancer Institute in Bangkok during November-2013 and December -2014 to determine the of OC use and BC risk. A total of 257 BC cases and controls were included in the study. Of the 514 women were both premenopausal and aged less than 45 years at the time of study. Cases and controls used the same questionnaire to obtain data collection. [5]

RESULT

In the first study is Demographic characteristics of cases and controls The case-control study(1:1) involved a total of 514 Thai Premenopausal Women(TPW). Those averaging age was 39 years. [5]

Their socio-demographic characteristics are outlined. To sum , most of them were 40-44 years of age (59.9 percent, 61.1 percent), married (61.8 percent, 60.7 percent), in higher education (39.7 percent, 51.4 percent), in Buddhism (96.5 percent, 96.1 percent), in the central region (68.5 percent), in office (35.8 percent, 33.8 percent). [5]

In the second study is a comparison between cases and controls in term of risk factors revealed that no significant differences were detected between cases and controls with regard to age groups, breastfeeding and breastfeeding duration, history of miscarriage, regularity of period, previous use of hormonal therapy for menstrual cycle irregularities, the type of contraceptive pills, whether it was combined hormonal or only progesterone type, and age when the first child was born. [6]

OC users account for 39%of breast cancer cases and 21.5 %of controls (including regular and intermittent use), whilst median use methods to test for significant association with breast cancer incidence.Regular use of OCs after adjustment for potential confounders showed association with breast cancer incidence (95%), while the period of use of OCs showed no association with breast cancer incidence. [6]

Discussion

According to the results of the first study. Women who frequently used OCs were 95 % at higher risk of developing breast cancer than their non-user counterparts, with no significant difference depending on the type of OCs used, whether they were a combination oral contraceptive (COC) or a progestin-only contraceptive (POC).

Oddly, the risk with the period of use of the OCs was not increased. Many risk factors include age at puberty menopause age, previous pregnancies, menopause status and cancer family history. The BC risk was not found to be correlated with current use of OCs even when considering different types of OCs. However, the BC incidence was found to be significantly different in menarche cases and age controls, menopausal status, number of pregnancies hormone medication use and family history. [5]

A very large-scale observational study from Denmark recently examined the relationship between the low-dose, more contemporary hormonal contraceptive formulations like progestin-only contraceptives, and the risk of breast cancer in women younger than 50 years of age. In line with our results, the study found that there is an increase in risk, but low, (about 20 %), but unlike ours, the risk was proportional to the period of use. This risk can also continue in women who used hormonal contraception for a minimum period of 5years after five years of cessation. [5]

TPW were the participants of the study, mostly between the ages of 40 and 44 (60 %). The socio-demographic features of cases and controls were quite similar. When controlled by patterns of health risk and reproductive factors, it was found that TPW with use of OC was risks to BC. Our results showed that people with OC use were nearly three times at risk of developing BC. It conformed to previous studies, several experiments meanwhile showed the opposite results. The reason for supporting the association due to estrogen hormone in OC pills is that it will synergy with different receptors on the surface of cancer cells and then send biochemical signals and activate cell multiplication, the association had no evidence of progesterone-only OC use. [6]

Moreover, the present studies showed that BC's risk had increased depending on the duration of OC use, and is consistent with some studies, collaborative Group on Hormonal Factors in Breast Cancer. Birth control for BC patients should therefore include progesterone contraceptive pills, medroxyprogesterone acetate injection depot,

progesterone intrauterine device (IUD), and so on. For Thais, women aged 20 to examine themselves should be aware and limitations of this strategy, support breast feeding after birth for 6 months, decrease alcohol consumption and decrease obesity, Surveillance of cancer risk and contraceptive use is therefore the key measure for reducing BC risks. [6]

Conclusion

Breast cancer is more often in women with an extensive history of Oral Contraceptive Pills use. This report is a long-term use of birth control pills, meaning that for more than 5 years, you will be at high risk for developing breast cancer.

Findings from this study have clinical practical implications. It's important to have this knowledge for women before they decide to start using OCs. Healthcare providers should help women make decisions about alternative methods of contraception for their partner, such as intrauterine devices with no hormone release, tubal ligation, and vasectomy. This decision needs to be made only after a careful discussion of benefits of contraception versus risks.

References

- 1-Mitchell, R., & Robbins, S. (2007). Robbins and Cotran pathologic basis of disease. (8th ed., pp. 617-626).
- 2- Ibrar Anjum, et al. (2019). "Does Taking Oral Contraceptive Pills Incease your Risk for Breast Cancer ? A Literature Review. EC Gynaecology 8.10:911-915.
- 3-Finkel, Richard; Clark, Michelle A.; Cubeddu, Luigi X.Lippincott's Illustrated Reviews: Pharmacology (4th Edition).
- 4- Brunton, Dandan, Knollmann, (2018), Goodman and Gilman's the pharmacological basis of therapeutics, (13th Ed.), Mc- Graw H.
- 5-Wisit Chaveepojnkamjorn, Natchaporn pichainarong, Rungsinoppadol, Thotong, Pratana Sativipawee, Supachai pitikultang(2017). Relationship between Breast Cancer and Oral Contraceptive Use among Thai Premenopausal Women. Asian pas J Cancer Prev, 18(5), 1429-1433.
- 6-Siegel RL, Miller KD, Jemal A (2015). Cancer statistics. CA Cancer J Clin, 65, 5-29.