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PROPHYLACTIC USE OF METFORMIN TO DECREASE THE INCIDENCE OF BREAST CANCER IN HIGH RISK, PREDISPOSED WOMEN

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Introduction

Breast cancer is the most common form of cancer in American women and is the leading cause of death between the ages of 40-44 years old. In 18 women will develop breast cancer in their lifetime, an alarming statistic and one that is becoming more prevalent in our country. The purpose of this research paper was to investigate prophylactic medication use for women who are at high risk for developing breast cancer, specifically evaluating whether the common diabetic medication Metformin is an effective prophylactic medication in these individuals prior to the onset of any type of cancer.

Literature Review

Insulin growth factor (IGF) levels are increased in malignancy and cell proliferation, as insulin does. This IGF is a protein hormone that when stimulated by insulin, promotes synthesis and biological activity. (Maguire, 2000) In 2013, McCance et al. concluded treatment with metformin has a significant effect of lowering total cancer incidence in women with diabetes. Studies show an association between IGF’s and breast cancer in the regulation of cell proliferation and apoptosis in tissues of normal and breast cancer cells. (Tsilidis et al., 2014) The utility of metformin in breast cancer treatment was also studied. It was found that metformin decreased circulating androgen and estrogen levels in nondiabetic women with breast cancer. Decreasing the risk of breast cancer, specifically ER positive breast cancer. (Berrino et al., 2010) Metformin does not affect cancer risk: A cohort study in the U.K. clinical practice research datalink analyzed newly diagnosed, untreated breast cancer patients who use metformin with type 2 diabetes have an overall decreased risk of developing any type of cancer. (Capothanassi et al., 2014). Metformin decreases circulating androgen and estrogen levels in nondiabetic women with breast cancer. (Berrino et al., 2010)

Discussion

The use of metformin, specifically when women are already diagnosed with breast cancer, decreases cancer deaths from breast cancer. (Berrino et al., 2010) Metformin decreases circulating androgen and estrogen levels in nondiabetic women with breast cancer. (Berrino et al., 2010) Metformin decreases circulating androgen and estrogen levels in nondiabetic women with breast cancer. (Berrino et al., 2010) Metformin decreases circulating androgen and estrogen levels in nondiabetic women with breast cancer. Decreasing the risk of breast cancer, specifically ER positive breast cancer. (Berrino et al., 2010)

Applicability to Clinical Practice

As the research suggested, breast cancer is the leading cause of death between ages 40-44 years old, yet there is conflicting recommendations on whether or not low risk women currently, it is recommended to discuss it with women between these ages, and routine screening with yearly mammograms is recommended at age 45. If there is a high-risk factor, these recommendations change.

Factors associated with increased risk of breast cancer

Race
Caucasian

Age
Older; Typically, Postmenopausal

Family history
Breast cancer in parent, sibling, or child. (higher risk if bilateral or premenopausal)

Genetics
BRCA1 or BRCA2 mutation

Previous medical history
Endometrial cancer, Proliferative forms of fibrocystic disease, (arrested or clear of the breast)

Menstrual history
Early menarche (<12 years old)

Reproductive history
Nulliparous or late first pregnancy (>30 years old)

Table 1: Current Diagnosis and Treatment (Papadakis, McPhee, 2017)

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