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Diabetes and breast cancer: The unsettled link

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Cancer is the second leading cause of death in the world, 1 in 4 women and 1 in 3 men, develop cancer during their lifetime. In 2015 there were 17.5 million incident cancer cases and 8.7 million cancer deaths globally. Diabetes prevalence has also grown rapidly. 415 million adults in 2015, with 5 million deaths attributed. Diabetes is a risk factor for all-site cancer for both men and women, but the increased risk is higher in women than in men. Diabetes, obesity and breast cancer are distinct diseases, but they do not occur in isolation. Does diabetes elevate the risk for developing breast cancer? The answer isn't completely settled yet, but diabetes could increase risk of developing post-menopausal breast cancer. A recent systematic search in PubMed MEDLINE to identify reports on the links between diabetes and cancer revealed that women with diabetes had a 27% higher risk of all-site cancer compared to women without diabetes for men with diabetes the risk was 19% higher than for men without. Calculation of the women-to-men ratio revealed that women with diabetes had a 6% greater excess risk of all-site cancer compared to men with diabetes. Possible explanations for the excess risk of all-site cancer conferred by diabetes in women, Hyperglycemia may have carcinogenic effects by causing DNA damage—an effect that would be potentially more pronounced in women whom were likely to be undertreated, receive less intensive care, or show lower adherence to anti-diabetic medication compared to men. Average duration of impaired glucose tolerance or impaired fasting glucose has been found to be over 2 years longer in women, with more exposure to untreated hyperinsulinemia in the pre-diabetes state which has been found to promote cancer cell proliferation. Recent research provides evidence that insulin drives signaling pathways that define the aggressive biology of estrogen-receptor negative breast cancer such as Akt/mTor and Wnt. For that notion Metformin is known to reduce circulating insulin, was studied in numerous ongoing clinical trials to test its ability in to prevent breast cancers. Findings from a recent observational study show type 2 diabetes increased the risk for an aggressive ER-negative breast cancer in African-American women by more than 40 percent, primarily in the women who had diabetes for at least 5 years and was only observed in non-obese black women contrary to the wide acceptable concept that obesity has long been recognized as a cause of both diabetes and breast cancer. If these results are confirmed, type 2 diabetes would be a modifiable risk factor for ER-negative breast cancer. The study did not show diabetes increased incidence of Estrogen Receptor (ER)-positive breast cancer, which is the most common subtype (75%) and has a very high survival rate. Women with breast cancer and diabetes face worse outcomes than those with breast cancer without diabetes. In a recent Canadian database study, all-cause mortality was increased in women with diabetes after adjusting for comorbidities, but breast cancer-specific mortality was not increased overall. Women with a longer duration of diabetes and those with pre-existing cardiovascular disease had increased all-cause and cancer-specific mortality. This study uncovers new information about key risk factors for poorer prognosis in women with diabetes and breast cancer. The connection between breast cancer and diabetes could also be a two-way street. Breast cancer survivors may also be at an elevated risk of developing diabetes after their treatment. Further long term studies are needed to clarify the clear link between diabetes and breast cancer.

Biography

Mahir Jallo is a Clinical Professor of Medicine, HOD and Senior Consultant, Internal Medicine-Diabetes and Endocrinology in Gulf Medical University, UAE and Faculty in the Canadian Academy of Natural Health. He has completed his MBChB from Mosul Medical College in Iraq and Postgraduate studies from the Board Certification in Internal Medicine CABM and PhD from the Arab Board. He has completed his Fellowship (FRCP Edin) from the Royal College of Physician in Edinburgh. He has completed his Fellowship from the American College of Endocrinology FACE in USA and Diploma in Dyslipidemia from Boston University School of Medicine in USA. He joined Thumbay Hospital-The Academic Health Center of Gulf Medical University in UAE, establishing the Diabetes and Endocrinology care in the hospital, the Endocrinology Module Coordinator for MBBS Program. He is the Editorial Board Member and Reviewer for many international diabetes and endocrinology journals. He is also the Member of many national and international medical societies and associations AACE, EASD, ISPAD, ESE and European Atherosclerosis Society.

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