Letter to the Editor

Cancer Epidemiology, Biomarkers & Prevention

Metformin Therapy and Breast Cancer Incidence and Mortality—Letter

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In a recent publication by Tang and colleagues (1) focused on the association of metformin with breast cancer incidence and mortality in patients with type II diabetes (T2D; ref. 1), they conducted a systematic review and meta-analysis to evaluate the effect of metformin on the incidence of breast cancer and all-cause mortality in patients with T2D (1). They observed that the use of metformin may improve overall survival in patients with T2D and breast cancer with no effect of metformin on the incidence of breast cancer (1). However, the authors conclude that the interpretation of results is limited by the observational nature of the studies and resulting biases highlighting that clinical trials are warranted to determine the role of metformin in breast cancer risk reduction and prognosis (1). Metformin represents the most widely used drug for the treatment of T2D today (2). A major mechanism of action of metformin is reduction of insulin resistance (2). Insulin resistance represents a key pathophysiologic defect of T2D (2). Insulin resistance has been connected with miR-26b and visfatin (3). miR-26b is an miRNA that is involved in a number of physiologic and pathologic processes including metabolism, energy homeostasis, and cancers (3, 4). Visfatin is a target of miR-26b (3, 5). Visfatin is a new adipokine that plays an important role in metabolic and stress responses (5). miR-26b expression has been found to be lower in subjects with insulin resistance compared with those without insulin resistance (4). miR-26b has been significantly related to insulin levels and the homeostasis model of assessment of insulin resistance (3). Moreover, a significant negative correlation has been shown between miR-26b expression and visfatin levels (3). It has been indicated that miR-26b plays a protective role in the molecular etiology of human breast cancer (4). miR-26b appears to be underexpressed in human breast cancer cell lines and clinical samples (4). It has been found that there is an association between elevated expression of visfatin with malignant behavior and adverse prognosis in breast cancer, suggesting that its inhibition may be an effective treatment for patients with breast cancer (5). Taken together, I suppose that the metformin antineoplastic effect in diabetic patients with breast cancer may be mediated by an increase in miR-26b and a reduction of visfatin levels as a result of the mechanism of action of the metformin to reduce insulin resistance. Large-scale clinical trials are needed in repositioning metformin for breast cancer prevention and treatment.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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