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Combined adjuvant aromatase inhibitor and metformin in overweight or obese postmenopausal breast cancer women

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Introduction: Metformin is an anti-diabetic oral hypoglycemic agent that considered the gold standard therapy for the treatment of type 2 diabetes. Retrospective analyses show that metformin can offer therapeutic benefits to patients with several forms of cancer. It also has positive weight reducing effect on non-diabetic patient through improving insulin sensitivity (although the exact underlying pathomechanisms remain to be elucidated).

Purpose: This prospective controlled study aimed to evaluate the effect of combined metformin adjuvant therapy and aromatase inhibitors (letrozole) in postmenopausal obese breast cancer women. In addition, to evaluate the effect of weight reduction on aromatase inhibitor efficacy.

Patients and methods: From February 2014 to June 2015, 70 Post-menopausal breast cancer females' patients were recruited, 53 patients underwent randomization, and 45 patients completed six months' treatment. Aromatase inhibitors (letrozole) was administered as once daily in accordance to one of the three groups. Control group: fifteen obese females who received letrozole only; metformin group: fifteen obese females received the same dose of letrozole plus metformin (2000 ± 500) mg daily, and lean group: fifteen non-obese breast cancer females received letrozole for six months' treatment period. Blood samples were collected at baseline and after six months of aromatase inhibitors treatment for analysis of serum estradiol, osteocalcin, insulin, leptin, lactate and glucose.

Results: Use of metformin resulted in a significant reduction of osteocalcin, insulin, leptin, fasting blood glucose (FBG), Homeostatic model assessment of insulin resistance (HOMA-IR) levels ($P < 0.0001$, $P = 0.0064$, $P < 0.0001$, $P < 0.0001$, $P = 0.0020$, respectively). However, metformin group showed non-significant difference in serum lactate levels compared to the other two groups. With regard to estradiol level, there was no statistically significant different between metformin group and the control group.

Conclusion: Our findings suggest that the use of metformin as an adjuvant treatment with aromatase inhibitor could be a promising therapeutic combination in treatment of postmenopausal breast cancer women.

Biography

Osama Ibrahim is affiliated to Department of Clinical Pharmacy, Faculty of Pharmacy, Tanta University, Egypt. He is a recipient of many awards and grants for his valuable contributions and discoveries in major area of subject research. His international experience includes various programs, contributions and participation in different countries for diverse fields of study. His research interests reflect in his wide range of publications in various national and international journals.