J Bioanal Biomed 2018, Volume 10
DOI: 10.4172/1948-593X-C1-039

11th EUROPEAN BIOSIMILARS CONGRESS

L-Carnitine in neoadjuvant systemic treatment in breast cancer patients with metabolic syndrome

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Background: The incidence of breast cancer in the world in general and in Ukraine in par-ticular is growing. In 2017, in Ukraine the incidence reached 16 percent of female popula-tion. According to the MOH (Ministry of Health) in Ukraine 26% of the female population for 2017 were overweight or obese. There is a strong biological basis for an association of obesity with poor breast cancer outcomes. Obesity - a chronic metabolic character, which is the result of the interaction of the endogenous factors, environmental conditions and life-style. Endogenous factors could be considered a violation of the genetic and hormonal bal-ance. The external conditions include irregular rhythm nutrition, use of substandard products.

Aim: The aim of this prospective randomized trial was to investigate the influence of L-Carnitine on the effectiveness of neoadjuvant systemic anticancer therapy (NAST) in breast cancer patients with metabolic syndrome (MS).

Methodology: The study included 64 patients (aged 44 to 78 years) who received neoadju-vant systemic treatment for stage II-III breast cancer, in Dnipropetrovsk Medical Academy at Municipal Institution "Dnipropetrovsk City Multi-field Clinical Hospital No 4", Dneprope-trovsk State Medical Academy from 2016-2017. All patients were evaluated according to the following data: stage of the disease, age and BMI at the time of diagnosis, the size, histologi-cal type and metastases, IHC (Immunohistochemistry) type, MRI (Magnetic Resonance Im-aging) methods, bioelectrical impedance analysis, Ultrasounds analysis. All patients were di-agnosed MS according to the IDF criteria and were compared by 2 groups; group 1 included 43 patients with MS and BC (Breast Cancer) who did not take L-Carnitine during NAST, and group 2 - 21 metabolic syndrome patients with breast cancer taking L-Carnitine with NAST. Clinical and pathological response rates were compared between the two groups using the fourfold table analysis method.

Results: Clinical complete response (CR) was identified in 6% patients from group 1 and in 28% patients from group 2. Clinical benefit response of treatment (CR + PR) was achieved in 68% of patients treated with L-Carnitine compared to 25% patients from group 1. In 53% of patients who were not taking metformin observed stabile disease (SD). The rate of pathologi-cal complete response (pCR) was 30% in the L-Carnitine group and 6% in the nonmetformin group.

Conclusions: Thus use of L-Carnitine in neoadjuvant systemic anticancer therapy breast can-cer patients with metabolic syndrome has a higher clinical and pathological CR rate and clin-ical benefit response of treatment than BC patient with MS not receiving L-Carnitine. This study demonstrated the potential of L-Carnitine as an antitumor agent in breast cancer pa-tients with metabolic syndrome.

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