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Body mass index as a prognostic feature in breast cancer

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Background: Breast cancer is the most common cancer diagnosed among women in the world. Current information on the prognostic importance of body mass index (BMI) for patients with breast cancer is based on a variety of equivocal reports. Few have data on BMI in relationship to systemic treatment has not been explored so far.

Aim: Aim of this retrospective study is to evaluate the relation between patients' breast cancer to obesity and the prognosis of treatment.

Materials & Methods: The study included 130 patients with breast cancer between 30 and 77 (57.6±1) years of age who were referred to our clinic, Department of Oncology and Medical Radiology; Dnipropetrovsk Medical Academy at Municipal Institution "Dnipropetrovsk City Multi-field Clinical Hospital #4", Dnepropetrovsk State Medical Academy from 2005-2015. All patients were evaluated according to the following data: Stage of the disease, age and BMI at the time of diagnosis, the size, histological type and metastases. Tumor size was evaluated after measuring its maximal diameter and distributed in accordance with the international TNM-classification (7th edition, 2009). The histological type and degree of differentiation of the tumor was evaluated respectively by the national standards of diagnostics and treatment of malignant neoplasms, reflecting the recommendations of leading international organizations. BMI is calculated by the formula: I=m×h2, where m- body weight (kg); h- height (m). According to these calculations the patients were divided in accordance with the WHO criteria into the following groups: Those with a BMI <25 kg/m2 - normal or underweight; from 25 to 29.9 kg/m2 - overweight; >30 kg/m2 - obese. The material for the histopathological study was obtained during surgery. We examined the relative risk of relapse and death with regard to the BMI categories adjusting for eight factors known to be predictors of disease-free survival (DFS) and overall survival (OS): Menopausal status, nodal status tumor size, vessel invasion, estrogen receptor (ER) status, progesterone receptor status, tumor grade and treatment regimens.

Results: In this retrospective study, among 130 patients with breast cancer, 45% were identified with excess body weight, and 31% - of various obesity degree. Patients with a BMI <25 kg/m2 were significantly more diagnosed with stage 2 breast cancer triple negative. BMI>30 kg/m2, 10% more often associated with metastatic RLN, which is an indirect sign of higher metastatic potentials. Patients with normal BMI had significantly longer overall survival (OS) and disease-free survival (DFS) than patients with intermediate or obese BMI in pairwise comparisons adjusted for other factors. We found a strong correlation between obesity and lymph node involvement. These observations suggest that obesity may potentiate the metastatic spread of breast tumors. Distant metastases were also found more often in obese patients in bone or visceral sites in patients <45 years of age at diagnosis.

Conclusions: In conclusion, this retrospective investigation of our patients demonstrates that BMI is an independent prognostic factor for OS in patients with breast cancer. We have supporting evidence that obese BMI represents a poor risk feature for outcome, especially in pre-/premenopausal patients, most of whom received chemotherapy without hormonal therapy.

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