Correlation of Leptin with Clinico-Pathological Features of Breast Cancer

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Abstract: Leptin is a multifunctional hormone produced mainly by adipocyte. Leptin and its receptor have long been found associated with breast cancer. The main aim of this study is to investigate the correlation between Leptin/Leptin receptor and the clinicopathological features of breast cancer. Blood samples for ELISA, tissue samples from tumors and adjacent breast tissue were taken from 51 women with breast cancer with a control group of 40 women with a negative mammogram. Leptin and Leptin receptor in the tissues were estimated by immunohistochemistry (IHC). They were localized at the subcellular level by immunocytochemistry using transmission electron microscopy (TEM). Our results showed significant difference in serum leptin level between control and the patient group, but no difference between pre and post-operative serum leptin levels in the patient group. By IHC, we found that the majority of the breast cancer cells studied, stained positively for leptin and leptin receptors with co-expression of leptin and its receptors. No significant correlation was found between leptin/leptin receptors expression with the race, menopausal status, lymph node metastasis, estrogen receptor expression, progesterone receptor expression, HER2 expression and tumor size. Majority of the patients with distant metastasis were associated with high leptin and leptin receptor expression. TEM views both Leptin and Leptin receptor were found highly concentrated within and around the nucleus of the cancer breast cells, indicating nucleus is their principal seat of actions while the adjacent breast epithelial cells showed that leptin gold particles are scattered all over the cell with much less than that of the cancerous cells. However, presence of high concentration of leptin does not necessarily prove its over-expression, because it could be internalized from outside by leptin receptor in the cells. In contrast, leptin receptor is definitely over-expressed in the ductal breast cancer cells. We conclude that reducing leptin levels, blocking its downstream tissue specific signal transduction, and/or blocking the upstream leptin receptor pathway might help in prevention and therapy of breast cancer.

Keywords : breast cancer, expression, leptin, leptin receptors

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