Serum leptin, prolactin and vascular endothelial growth factor (VEGF) levels in patients with breast cancer

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Angiogenesis plays an important role in tumor growth and metastasis in solid tumors. VEGF is an important regulator of tumor angiogenesis. Both leptin and prolactin have also been suggested to have roles in the regulation of angiogenic process. In our study, we measured serum leptin, prolactin and VEGF levels in 30 metastatic, 55 non-metastatic breast cancer patients and 25 control subjects. Serum leptin levels were found to be similar in non-metastatic (38.1 ± 19.5 ng/ml), metastatic patients (39.6 ± 16.3 ng/ml) and control subjects (35.6 ± 13.9 ng/ml) ($p>0.05$). There was no statistically significant difference between patients with visceral metastasis (44.0 ± 16.8 ng/ml) and patients with bone metastasis (35.2 ± 15.0 ng/ml) ($p>0.05$). Serum prolactin levels were found to be similar in non-metastatic (12.2 ± 10.7 ng/ml), metastatic patients (11.6 ± 8.2 ng/ml) and control subjects (12.3 ± 8.1 ng/ml), ($p>0.05$). Moreover, serum prolactin levels were not different in patients with visceral (11.4 ± 8.8 ng/ml) and bone metastasis (11.8 ± 8.0 ng/ml), ($p>0.05$). Metastatic patients had higher serum VEGF levels (249.8 ± 154.9 pg/ml), when compared to the non-metastatic patients (138.7 ± 59.3 pg/ml) and control subjects (108.4 ± 47.7 pg/ml), ($p<0.05$). There was no difference in serum VEGF levels in non-metastatic patients and control subjects ($p>0.05$). Patients with visceral metastasis (337.0 ± 168.0 pg/ml) had higher serum VEGF levels, when compared to patients with bone metastasis (162.6 ± 71.8 pg/ml), ($p<0.05$). Serum VEGF activity may be used to evaluate angiogenic and metastatic activity in breast cancer patients. However, serum leptin and prolactin levels does not seem to be related with angiogenic activity and metastasis in breast cancer patients.

Key words: Breast cancer, VEGF, leptin, prolactin, angiogenesis.

Angiogenesis, the development of new blood vessels, plays an important role in tumor growth and metastasis [22]. Many clinical studies have demonstrated that angiogenesis is a potent prognostic factor for breast cancer patients [32, 33]. Vascular endothelial growth factor (VEGF) is an endothelial cell mitogen that is involved in the multiple process of carcinogenesis [5, 12, 28]. VEGF has been reported to be the major angiogenic factor in breast cancer and appears to play a key role in pathological angiogenesis [15, 32]. Moreover, VEGF expression in tumor tissue has been reported to be an independent prognostic factor for breast cancer patients regardless of nodal status [10, 15, 24]. A number of positive and negative factors besides VEGF may also be involved in the regulation of angiogenesis [14].

Leptin, the adipocyte derived hormone, is a 16 kDa protein that plays a key role in the control of satiety and energy expenditure [9]. Recently, additional biological functions such as antiapoptotic and angiogenic activity have also been reported for leptin [3, 19, 30]. It has been reported that leptin may promote the tumor growth by stimulating angiogenesis in prostate cancer [31]. It has been reported that leptin synergistically stimulates angiogenesis with VEGF [3] and that magnitude of stimulation of angiogenesis by leptin is similar to that induced by VEGF [2, 30].

Prolactin is a major growth and differentiating hormone in the human breast and may play a role in the pathogenesis and progression of breast carcinoma [1, 18]. It has been suggested that an increase in prolactin secretion may be responsible for the elevation of leptin levels [26]. Prolactin is involved in the control of angiogenesis through its cleaved