

HER-2 gene amplification, serum nucleosomes, CEA and CA15.3 tumor markers in breast cancer patients

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Breast cancer is the most frequently diagnosed cancer in women in the world, for which tumor markers are needed for early detection, clinical prognostication and monitoring. The study was designed to assess the usefulness of HER-2 gene amplification, serum nucleosomes, CEA and CA15.3 tumor markers in the diagnosis of invasive ductal carcinoma and analyze whether their levels correlate with the clinicopathological features. The study was carried out on fifty patients with invasive ductal carcinoma and 25 age matched women with benign breast diseases (BBD). Cancer patients were categorized into three subgroups according to absence (-) or presence (+) of axillary lymph nodes (N) or presence of distant metastasis (M+) into: subgroup I (N-) included 15 patients, subgroup II (N+) included 20 patients and subgroup III (M+) included 15 patients. All individuals were subjected to CBC, fasting blood sugar, liver & kidney function tests, CEA and CA15.3 by electrochemiluminescence, serum nucleosomes by cell death detection ELISA and amplification of HER-2 gene by differential PCR. The HER-2 gene PCR results were + ve in 28% of cancer patients; 20% of subgroup I, 25% of subgroup II and 40% of subgroup III, but in none of the BBD patients. HER-2 gene amplification results showed significant positive correlation with tumor grade. Serum nucleosomes showed significant increase in cancer patients as compared to that of BBD group, significant negative correlation with HER-2 gene amplification and significant positive correlation with CA15.3. Serum nucleosomes was the most sensitive marker (76% versus 32% and 50% for CEA & CA15.3 respectively) but the least specific (72% versus 92% and 96% for CEA & CA15.3 respectively). Elevated CEA and CA15.3 levels were detected in 13.3% and 33.3% respectively in node negative patients, these percentage increased in node positive patients to 20% and 40% and in metastatic patients to 66.7% and 80% respectively. In conclusion, serum nucleosomes is more sensitive but less specific marker than CEA and CA15.3 for diagnosis of early-stage breast cancer. HER-2 gene amplification is a potential prognostic marker for advanced stage breast cancer.