ANALYSIS OF BLOOD CIRCULATING SERUM BIOMARKERS FOR THE DIAGNOSIS OF BREAST CANCER IN BENAZIR BHUTTO HOSPITAL, RAWALPINDI

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Abstract:
Introduction: Breast cancer is the most common neoplasm in women and the second leading cause of cancer-related mortality in females worldwide. Objectives of the study: This basic aim of the study is to analyse the blood circulating serum biomarkers for the diagnosis of breast cancer in Benazir Bhutto Hospital, Rawalpindi. Methodology of the study: This cross sectional study was conducted in Benazir Bhutto Hospital, Rawalpindi during March 2019 to January 2020. The data was collected from 50 patients who were suffering from breast cancer. The main eligibility requirements for this study included the patient's written informed consent, metastatic breast cancer, patients entering first-line chemotherapy. Results: The results indicates that CTC, CEA and ALP are the best indicating serum biomarkers for the diagnosis and progression of breast cancer. Mean, median and SD shows that there is a significant relationship in these serum biomarkers. Conclusion: It is concluded that biomarkers and TAC are the useful tool for the analysis of progression of breast cancer in females.

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INTRODUCTION:

Breast cancer is the most common neoplasm in women and the second leading cause of cancer-related mortality in females worldwide. Breast cancer is the second most common type of cancer (after lung cancer), and the fifth most common cause of cancer death. Breast cancer, the most common cancer among women worldwide, accounts for the highest morbidity and mortality[1]. The etiology of breast cancer is multifactorial and numerous risk factors associated with breast cancer may exert their effects via generation of an oxidative stress status[2]. In all over the world, breast cancer is considered the most common type of cancer among women. Every year, breast cancer accounts for 22% of new cancers found in women. Breast cancer is a disease with multiple etiological factors linked to genetic, environmental, social demographic, behavioral, psychological and hormonal factors[3].

Tumor heterogeneity that enables malignant progression by evolutionary selection is also the major cause of emergent resistance during cancer treatment[4]. Yet, we rely on few standard diagnostic tumor biopsies for the characterization of a given cancer. These specimens will provide only a partial characterization of the overall makeup of the dynamic systemic disease cancer represents with intratumoral and interlesional heterogeneity as well as emerging host responses[5].

Some blood-borne tumour markers have demonstrated ability to detect malignancy before clinical diagnosis and are currently being evaluated in screening trials for certain cancers; for example, CA125 for screening ovarian cancer. Breast cancer markers in clinical practice are used for predicting response to therapy, monitoring after primary therapy or as prognostic indicators[6].

Objectives of the study

This basic aim of the study is to analyse the blood circulating serum biomarkers for the diagnosis of breast cancer in Benazir Bhutto Hospital, Rawalpindi.

METHODOLOGY OF THE STUDY:

This cross sectional study was conducted in Benazir Bhutto Hospital, Rawalpindi during March 2019 to January 2020. The data was collected from 50 patients who were suffering from breast cancer. The main eligibility requirements for this study included the patient's written informed consent, metastatic breast cancer, patients entering first-line chemotherapy (chosen by clinicians) with or without targeted therapy, life expectancy of at least three months, and measurable or evaluable disease.

Statistical analysis

The data were analyzed by using SPSS and using one-way analysis of variance (ANOVA) followed by multiple comparison test. All biochemical experiments were performed thrice in triplicates to ensure reproducibility.

RESULTS:

The results indicates that CTC, CEA and ALP are the best indicating serum biomarkers for the diagnosis and progression of breast cancer. Mean, median and SD shows that there is a significant relationship in these serum biomarkers. CTC and serum marker values at inclusion repartition in percentile, mean, median range are given in Table 1.

Table 01: Serum marker values repartition at inclusion

	Mean	SD	Quantile 0%	Quantile 25%	N
CEA	7.20	18.23	0.04	0.4	212
CYFRA21	9.01	29.51	0.1	0.65	191
LDH	1.39	2.02	0.28	0.71	220
ALP	1.056	1.00	0.26	0.58	241

DISCUSSION:

The need for novel independent prognostic factors in metastatic breast cancer patients is much lower than the need for dynamic blood markers, which can indicate the treatment efficiency in a reliable and early fashion[7]. Here, by comparing the early and late changes of five blood markers together with CTC changes for PFS prediction, we showed no clear superiority of CTC over the other serum markers[8]. This result was, however, not the primary endpoint of our study, and the statistical power of these analyses may still be discussed, although performed in more than 200 patients[9-10].

CA15-3 is perhaps the best known, non-invasive marker of breast cancer, although its recommended clinical use is restricted to monitoring of patients with metastatic disease during active therapy. Herein, CA15-3 levels in serum taken at a median time of 13.8 months before clinical diagnosis showed consistency with respect to stage, grade and nodal status within cases, although it failed to discriminate cases from controls. This suggests that CA15-3 may serve as a pre-diagnostic marker of a

more aggressive tumour phenotype, in line with previous reports of the prognostic value of CA15-3 in breast cancer[11].

CONCLUSION:

It is concluded that biomarkers and TAC are the useful tool for the analysis of progression of breast cancer in females.

REFERENCES:

1. Pshezhetsky AV, Ashmarina LI. Desialylation of surface receptors as a new dimension in cell signaling. Biochemistry (Mosc) 2013;78(7):736–745

2. Wang FL, Cui SX, Sun LP, et al: High expression of α2,3-sialic acid residues is associated with the metastatic potential of human gastric cancer. Cancer Detect Prev 32: 437-443, 2009

3. Ohyama C, Hosono M, Nitta K, et al: Carbohydrate structure and differential binding of prostate specific antigen to Maackia amurensis lectin between prostate cancer and benign prostate hypertrophy. Glycobiology 14: 671-679, 2004.

4. Hynes RO: Integrins: bidirectional, allosteric signaling machines. Cell 110: 673-687, 2002

5. Taniguchi A, Hioki M and Matsmoto K: Transcriptional regulation of human ST4GalIV gene in testis and ovary cell line. Biochem Biophys Res Commun 301: 764-768, 2003.

6. Christie DR, Shaikh FM, Lucas JA IV, Lucas JA III and Bellis SL: ST6Gal-I expression in ovarian cancer cell promotes an invasive phenotype by altering integrin glycosylation and function. J Ovarian Res 1: 3-10, 2008.

7. Pierga JY, Deneux L, Bonneton C, Vincent-Salomon A, Nos C, Anract P, Magdelenat H, Pouillart P, Thiery JP: Prognostic value of cytokeratin 19 fragment (CYFRA 21-1) and cytokeratin-positive cells in bone marrow samples of breast cancer patients. Int J Biol Markers. 2004, 19: 23-31.\

8. Ohyama C, Hosono M, Nitta K, et al: Carbohydrate structure and differential binding of prostate specific antigen to Maackia amurensis lectin between prostate cancer and benign prostate hypertrophy. Glycobiology 14: 671-679, 2004.

9. Hynes RO: Integrins: bidirectional, allosteric signaling machines. Cell 110: 673-687, 2002

10. Taniguchi A, Hioki M and Matsmoto K: Transcriptional regulation of human ST4GalIV gene in testis and ovary cell line. Biochem Biophys Res Commun 301: 764-768, 2003.

11. Kim BK, Lee JW, Park PJ, Shin YS, Lee WY, Lee KA, Ye S, Hyun H, Kang KN, Yeo D, Kim Y, Ohn SY, Noh DY, Kim CW (2009) The multiplex bead array approach to identifying serum biomarkers associated with breast cancer. Breast Cancer Res 11: R22.