The Role of Some Biomarkers in Early Detection of Bone Metastasis in Egyptian Breast Cancer Patients

Thesis Submitted by

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Declaration

This thesis has not been submitted for a degree at this or any other university

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Dedication

To my father, my mother, my brother, my fiancé
&
My real friends
Their love, encourage, help and prayers made studies possible and to them I owe everything.

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The Role of Some Biomarkers in Early Detection of Bone Metastasis in Egyptian Breast Cancer Patients

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Abstract

The present study was undertaken to identify post-operative simple biochemical markers for prediction of bone metastases in Egyptian breast cancer patients. Seventy eight cases with breast cancer (BC) after mastectomy were included. From these patients, 46 had no bone metastasis **(NBM)** and 32 with radiologically confirmed bone metastasis **(BM)**. Patients with **NBM** were further observed for a1 year by bone scan in order to monitor development of bone metastasis **(New BM)**. Nine healthy women with no history of breast disease or metabolic bone disease were included for reference ranges. Parameters included full blood picture, blood tumor markers (carcinoembryonic antigen [CEA] and cancer antigen [CA 15.3]), breast tissue receptor markers (estrogen receptor [ER], progesterone receptor [PR] and human epidermal growth factor receptor 2 [HER-2]), together with blood biochemical markers (tartrate-resistant acid

phosphatase [TRAP5b], vascular endothelial growth factor [VEGF], alkaline phosphatase [ALP] and zinc). Analyses showed significantly elevated CEA, ALP, and the inflammation markers; ALP/monocytes% and platelet^2/(monocytes%+segmented neutrophils%) (P2ms) at the time of primary diagnosis in patients with BM, compared to those without BM. Elevated CA 15.3, P2ms, VEGF and lower monocytes% were independently associated with the development of New BM (4 patients). The increase in TRAP activity was related to progesterone receptor expression in breast cancer tissues. In conclusion, this study provides evidence that circulating markers of cancer; CA 15.3, vascularization (VEFG/monocytes %) and inflammation (P2ms) markers have the highest prognostic value for predicting development of BM within one year in breast carcinoma patients.

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