The Significance of Endothelin-Converting Enzyme-1 and Mannan-Binding Lectin as a Predictive Biomarkers in Breast Cancer Malignancy

Ahmed Adnan Lafta, BSc, MSc *, Estabraq AR. Al-Wasiti, Prof. Dr. PhD.** , RAWAA A. Sattar A. ,WAHHAB, M.B.Ch.B, F.I.C.M.S***

ABSTRACT

Breast cancer, particularly Invasive Ductal Carcinoma (IDC), is the most prevalent malignancy among women worldwide. Early detection remains challenging, especially in younger women. Endothelin-Converting Enzyme-1 (ECE-1) and Mannan-Binding Lectin (MBL) have emerged as potential biomarkers due to their roles in tumor angiogenesis, immune modulation, and inflammatory pathways. This study evaluated serum ECE-1 and MBL levels in distinguishing malignant from benign breast disease. A cross-sectional study was conducted on 160 females (20–40 years) divided into three groups: IDC (n=40), benign braeast disease (BBD, n=40), and healthy controls (n=80). Serum ECE-1 and MBL were quantified using sandwich ELISA. Data were analyzed with one-way ANOVA, Tukey post-hoc tests, Pearson correlation, and ROC curve analysis, with $p<0.05$ considered significant. IDC patients showed significantly elevated serum ECE-1 (62.57 ± 8.34 U/L) and MBL (221.03 ± 23.31 ng/mL) compared to BBD (28.12 ± 3.51 U/L; 160.6 ± 21.86 ng/mL) and controls (8.54 ± 1.56 U/L; 81.82 ± 6.41 ng/mL) ($p<0.001$). Both biomarkers correlated positively within patient groups (IDC: $r=0.373$, $p=0.018$; BBD: $r=0.495$, $p=0.001$). ROC analysis revealed higher diagnostic accuracy for ECE-1 (AUC=0.773; sensitivity 72.8%, specificity 93.1%) than MBL (AUC=0.717; sensitivity 67.2%, specificity 89.7%. Elevated serum ECE-1 and MBL are significantly associated with IDC and may serve as useful non-invasive biomarkers. ECE-1 demonstrated superior diagnostic performance, suggesting its potential utility—alone or within a biomarker panel—for early breast cancer detection and differentiation from benign disease.

Keywords: Endothelin-Converting Enzyme-1 (ECE-1), Invasive Ductal Carcinoma (IDC), Mannan-Binding Lectin, Tumor Angiogenesis, Inflammatory Mediators in Cancer.

Bahrain Med Bull 2026; 48 (1): 2858-2863

* Department of Chemistry and Biochemistry
College of Medicine, Al-Nahrain University, Iraq.
E-mail:ahmedadnrt876@gmail.com

** Department of Surgery, College of Medicine
Al-Nahrain University, Baghdad, Iraq.