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HE4: A New Potential Tumor Marker for Early Diagnosis and Prediction of Breast Cancer Progression

Background

Accurate and early diagnosis of breast cancer (BC) remains critical for effective treatment and improved outcomes. Human epididymal protein 4 (HE4) has emerged as a promising biomarker in various malignancies. This study aimed to evaluate the diagnostic and prognostic potential of HE4, in comparison and combination with CEA, CA 15-3, and CYFRA 21-1, in patients with breast cancer.

Methods

Serum levels of HE4, CEA, CA 15-3, and CYFRA 21-1 were measured using chemiluminescent and electrochemiluminescent immunoassays in three groups: 80 women with histologically confirmed breast cancer (stage I–IV), 80 women with early-stage BC (stage I–II) prior to surgery, and 80 controls (40 healthy women and 40 with benign breast disease). Receiver operating characteristic (ROC) curves were constructed to assess diagnostic performance of individual and combined markers.

Results

ROC analysis demonstrated that HE4 had the highest diagnostic sensitivity and specificity among early-stage BC patients prior to surgery. In contrast, CYFRA 21-1 was most effective in detecting disease progression or recurrence during follow-up. The combination of markers significantly improved diagnostic accuracy compared to individual markers alone.

Conclusions

Tumor markers, particularly HE4 and CYFRA 21-1, represent valuable non-invasive tools for both the early detection and dynamic monitoring of breast cancer. Their integration into clinical practice may refine diagnostic pathways and guide therapeutic decision-making.

Biography

Dr. Martina Pestová is affiliated with University Hospital Pilsen and the Faculty of Medicine in Pilsen, Charles University, Prague, Czech Republic. Her clinical and research work focuses on breast cancer progression, combining academic insight with hands-on experience in patient care.

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