Tissue ELISA and serum amperometric magnetoimmunosensor of ECD HER2 validity in the stratification of breast cancer sub types among Egyptian female patients

Prof. Dr. Eman El-Abd

Abstract

To compare tissue human epidermal growth factor receptor2 (tHER2) and serum HER2 (sHER2) detected by Enzyme-linked immunosorbent assay (ELISA) and amperometric magnetoimmunosensor (AM) and to correlate them with clinicopathological parameters, and serum cancer antigen 15-3 (sCA15-3), blood and tissues were collected from 72 females; 20 controls, five recurrent breast tumours, and 47 breast cancers (BCs). tHER2 level (ELISA) \( (p = 0.045) \) and sCA15-3 \( (p = 0.048) \) significantly differed among groups. tHER2 (ELISA) significantly decreased \( (p = 0.02) \) with higher Body Mass Index (BMI) in equivocal HER22+ group. A significant direct correlation \( (r = 0.9, p = 0.037) \) observed between tHER2 and sHER2 (AM) in HER23+ group. Upon classification of BC into triple negative (TN), liminal A, luminal B, and HER2 groups; tHER2 (ELISA) significantly differed \( (p = 0.017) \). A significant direct correlation \( (r = 0.857, p = 0.014) \) observed between tHER2 and sHER2 levels (ELISA) in HER2 enriched subgroup. sHER2 level (AM) showed high sensitivity and specificity in differentiating between TN from luminal A at cut off value > 9.26 ng/ml \( (p = 0.003) \) and HER2 at cut off value of 9.6 ng/ml \( (p = 0.0450) \) but at cut off value of > 1.67 ng/ml, tHER2 (ELISA) stratified TN from luminal A \( (p = 0.04) \), luminal A from luminal B \( (p = 0.003) \), HER-2 from luminal A \( (p = 0.011) \), HER-22+ from HER21+ \( (p = 0.016) \), and HER3+ from HER21+ \( (p = 0.004) \). In conclusion, tissue ELISA and serum AM provided useful quantitative measurements for HER2 in various BC subtypes.