

## CAN SEX HORMONE CONCENTRATIONS PREDICT HER2 STATUS OF POSTMENOPAUSAL BREAST CANCER PATIENTS?

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Human epidermal growth factor receptor (HER2) is a transmembrane receptor on breast cells that aid in controlling growth of breast cells. About 15%-25% of breast cancers (BC) over express HER2 protein and is associated with poor prognosis. Estrogen is found to be down regulating HER2 gene. However, no data on serum progesterone and testosterone concentrations and their associations with HER2 status is available. Thus this study was designed to analyze the possible associations between serum sex hormone concentrations and HER2 status of postmenopausal BC patients. Consent was obtained from newly diagnosed postmenopausal BC patients (n=75) selected from National Cancer Institute Maharagama. Serum estrogen, testosterone and progesterone concentrations were measured using Minividasimmuno analyzer. HER2 status was obtained from request forms. Statistical analysis (Kruskalwallis and ROC curve) was done by SPSS version 16 (Ethical approval -651/32). More than half of the study sample (55%) was HER2 negative and 35% showed a moderate/borderline (equivocal) HER2 expression. Over expression of HER2 was observed only among 10%. Mean serum testosterone, estrogen and progesterone concentrations were 0.25 ( $\pm$ 0.19 ng/mL), 15.47 ( $\pm$ 7.8pg/mL) and 0.38 ( $\pm$ 0.4ng/mL) respectively. Significant differences in serum testosterone and estrogen concentrations with respect to HER2 expression status was not observed ( $p > 0.05$ ). However, serum progesterone concentration had a significant negative association with HER2 status ( $r = -0.34$ ,  $p = 0.03$ ). The contribution of progesterone for the HER2 expression studied via ROC curve showed 81% ( $p < 0.05$ , CI 0.67-0.94) of area under the curve with a progesterone cutoff value of 25ng/mL with 76% sensitivity and 66% specificity. While serum estrogen and testosterone cannot be used in predicting HER2 status of post menopausal BC women, the progesterone concentrations  $< 0.25$ ng/mL can be used as a cut off value in predicting over expression of HER2 with 76% sensitivity and 66% specificity.

**Keywords:** Breast Cancer, HER2 Status, Sex Hormones