Detection and Prognostic implication of Molecular Pathways in Oral Cancer Progression

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Objective

Artificial neural networks (ANNs) and Classification and Regression Trees (CARTs) have been previously used for the prediction of cancer in severa lfields. In our study, we aim to investigate the diagnostic accuracy of three different methodologies logistic regression, ANNs and CARTs for the prediction of endometrial cancer in post-menopausal women with post-menopausal vaginal bleeding or endometrial thickness ≥ 5 mm, as determined by ultrasound examination.

Study design

We conducted a retrospective case control study based on data drawn from analysis of pathology reports of curettage specimens in postmenopausal women.

Methods

Classical regression analysis was performed along with ANN and CART analysis using the IBM SPSS and Matlab statistical packages.

Results

Overall, 178 women were enrolled. Among them, 106 women were diagnosed with carcinoma; where as there maining 72 women had normal histology in the final specimen. ANN analysis seems to perform better with a Sensitivity of 86.8%, Specificity of 83.3% and over all accuracy of 85.4%. CART analysis did not perform as well with a Sensitivity of 78.3% a Specificity of 76.4% and over all accuracy of 77.5%. Regression analysis had a poorer predictive accuracy with a sensitivity of 76.4%, a specificity of 66.7% and an over all accuracy of 72.5%.

Conclusion

Artificial intelligence is a powerful mathematical tool that may significantly promote public health as it may be used as a non-invasive screening tool that may guide clinicians involved in primary care in decision making when endometrial pathology is suspected.

Keywords: endometrial cancer; prediction; ANN; neural network; CART