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Neural Network Analysis of Breast Cancer from Mammographic Evaluation

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
Abstract:

Background/Objective: Mammographic differentiation of benign lesions from malignancies is a difficult task. We developed an artificial neural network (ANN) as a diagnostic aid in mammography using radiographic features as input. Materials & Methods: A three-layered ANN was used to differentiate malignant from benign findings in a group of patients with proven breast lesions on the basis of morphological data extracted from conventional mammograms. Our database included 122 patient records on 14 qualitative variables. The database was randomly divided into training and validation samples including 82 and 40 patient records, respectively, to construct the ANN and validate its performance. Sensitivity, specificity, accuracy and receiver operating characteristic curve (ROC) analysis for this method and the radiologist were compared. Results: Our results showed that the neural network model was able to correctly classify 30 out of 40 cases presented in the validation sample. Comparing the output with that of the radiologist, showed a reasonable diagnostic accuracy (75%), a moderate specificity (64%) and a relatively high sensitivity (89%). Conclusion: A diagnostic aid was developed that accurately differentiates malignant from benign pattern using radiological features extracted from mammograms.

Keywords:

computer , neural network

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