POSTER ABSTRACT SUBMISSION

Advances in Early Detection of Breast Cancer Using AI Imaging

A Comparative Study of Machine Learning Models in Oncology Diagnostics

Author:	Dr. Priya Sharma	**Country:**	India
Institution:	All India Institute of Medical Sciences (AIIMS), New Delhi	**Email:**	dr.priya@aiims.edu

Abstract

This study explores the application of artificial intelligence and machine learning algorithms in the early detection of breast cancer through medical imaging. Comparing multiple AI models against traditional diagnostic methods, the research demonstrates a significant improvement in detection accuracy and a reduction in false-positive rates, offering a promising pathway for improving patient outcomes in early-stage breast cancer diagnosis.

Objective

To evaluate and compare the diagnostic accuracy of AI-based imaging models versus conventional mammography screening in identifying early-stage breast cancer in a diverse patient population.

Methodology

A retrospective cohort study was conducted on 1,200 anonymised mammogram images sourced from the AIIMS radiology department. Three machine learning models — Convolutional Neural Network (CNN), ResNet-50, and a custom hybrid model — were trained and validated against expert radiologist diagnoses. Performance metrics including sensitivity, specificity, and AUC were computed.

Results

The hybrid AI model achieved a sensitivity of 94.2% and specificity of 91.8%, outperforming conventional screening (sensitivity 82.1%, specificity 87.3%). False-positive rates were reduced by 18% compared to standard mammography. The CNN model showed the fastest processing time at an average of 1.3 seconds per image.

Conclusion

AI-assisted imaging demonstrates strong potential to augment early breast cancer detection, particularly in high-volume screening environments. Integration into existing clinical workflows could significantly improve early-stage diagnosis rates and reduce unnecessary biopsies.