Association of mammographic and sonographic findings with molecular subtypes among breast cancer patients in Sultan Ahmad Shah Medical Centre (SASMEC @IIUM), East Coast Malaysia

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ABSTRACT

Introduction: The main purpose of the study is to determine the association between mammographic and sonographic findings with molecular subtypes among breast cancer patients in SASMEC @IIUM. **Materials and Methods:** This cross-sectional study recruited a total of 152 breast cancer respondents. Retrospective reviews were conducted on patients' records (i-Pesakit) and PACS-RIS from April 2018 till April 2025 whereby background characteristics, molecular subtypes, mammogram and ultrasound features of breast cancer were studied. Analysis between background characteristics, mammogram and ultrasound features of breast cancer with the molecular subtypes was determined. **Results:** This study identified key imaging and clinical features associated with breast cancer molecular subtypes. Lesions with well-defined or obscured margins were significantly less likely to be luminal-type tumours (adjusted ORs=0.045 and 0.116, respectively), as were oval-shaped masses (adjusted OR=0.148, p=0.016). For HER2-enriched tumours, well- circumscribed margins strongly predicted this subtype (adjusted OR=21.252, p=0.005), as did the presence of calcifications on ultrasound (adjusted OR=4.782, p=0.016). In triple- negative breast cancer (TNBC), postmenopausal status increased the likelihood of diagnosis of over sixfold (adjusted OR=6.384, p=0.024), and posterior acoustic enhancement was a significant sonographic predictor (adjusted OR=6.819, p=0.003). Other mammographic and sonographic features did not show significant associations with molecular subtypes. **Conclusion:** Distinct imaging and clinical features are associated with different breast cancer molecular subtypes. These findings highlight the value of imaging in predicting molecular subtypes, guiding personalized treatment and potentially enhancing the diagnostic value of conventional breast imaging prior to the information obtained from the more definitive yet invasive tissue sampling

Keywords: Breast neoplasm, mammography, ultrasonography, molecular subtype, imaging features, triple negative breast cancer