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RESEARCH

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Detection and diagnosis of automated breast ultrasound in patients with BI-RADS category 4 microcalcifications: a retrospective study

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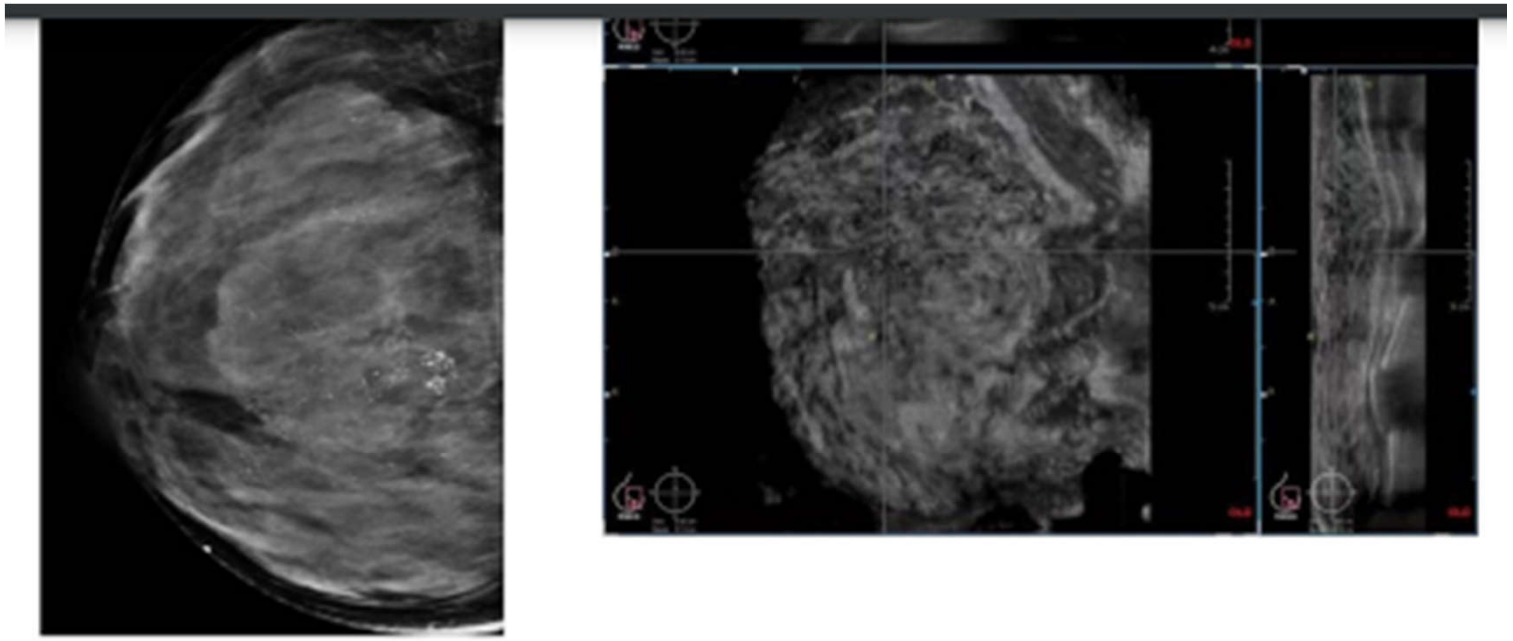
Abstract

Background Automated Breast Ultrasound (AB US) has shown good application value and prospects in breast disease screening and diagnosis. The aim of the study was to explore the ability of AB US to detect and diagnose mammographically Breast Imaging Reporting and Data System (BI-RADS) category 4 microcalcifications.

Methods 575 pathologically confirmed mammographically BI-RADS category 4 microcalcifications from January 2017 to June 2021 were included. All patients also completed AB US examinations. Based on the final pathological results, analyzed and summarized the AB US image features, and compared the evaluation results with mammography, to explore the detection and diagnostic ability of AB US for these suspicious microcalcifications.

Results 250 were finally confirmed as malignant and 325 were benign. Mammographic findings including microcalcifications morphology (61/80 with amorphous, coarse heterogeneous and fine pleomorphic, 13/14 with fine-linear or branching), calcification distribution (189/346 with grouped, 40/67 with linear and segmental), associated features (70/96 with asymmetric shadow), higher BI-RADS category with 4B (88/120) and 4 C (73/38) showed higher incidence in malignant lesions, and were the independent factors associated with malignant microcalcifications. 477 (477/575, 83.0%) microcalcifications were detected by AB US, including 223 malignant and 254 benign, with a significantly higher detection rate for malignant lesions ($x^2 = 12.20$, $P < 0.001$). Logistic regression analysis showed microcalcifications with architectural distortion (odds ratio [OR] = 0.30, $P = 0.014$), with amorphous, coarse heterogeneous and fine pleomorphic morphology (OR = 3.15, $P = 0.037$), grouped (OR = 1.90, $P = 0.017$), liner and segmental distribution (OR = 8.93, $P = 0.004$) were the independent factors which could affect the detectability of AB US for microcalcifications. In AB US, malignant calcification was more frequent in a mass (104/154) or intraductal (20/32), and with ductal changes (30/41) or architectural distortion (58/68), especially with the both (12/12). BI-RADS category results also showed that AB US had higher sensitivity to malignant calcification than mammography (64.8% vs. 46.8%).

Conclusions AB US has good detectability for mammographically BI-RADS category 4 microcalcifications, especially for malignant lesions. Malignant calcification is more common in a mass and intraductal in AB US, and tend to



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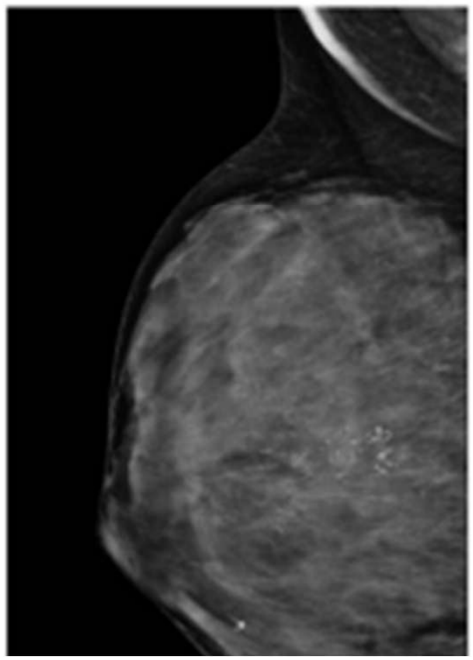

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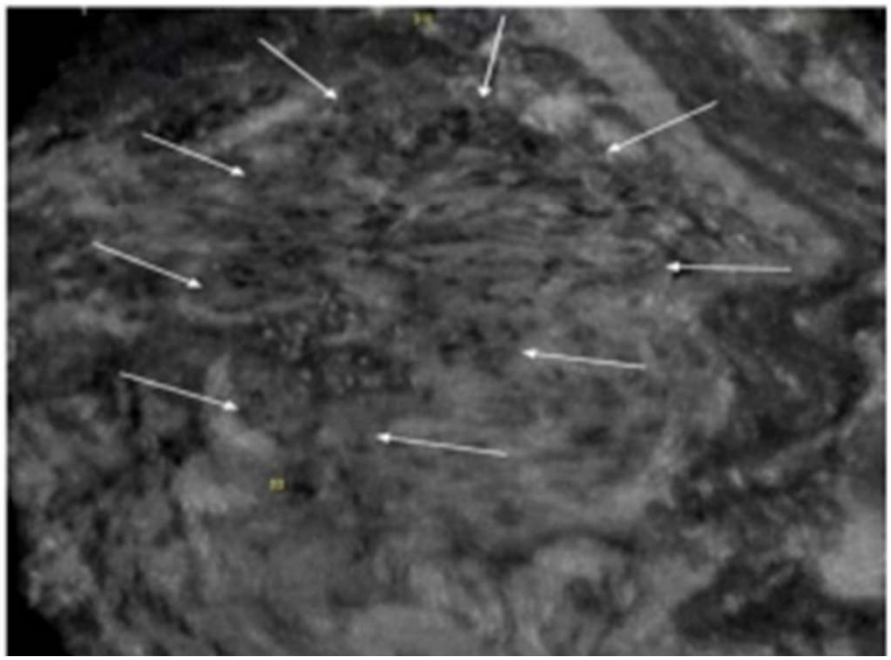

Conclusions

AB US has good detectability for BI-RADS category 4 suspicious microcalcificationa, especially for malignant calcification lesions. Malignant calcification is more common in a mass and intreductral in AB US, and when associated with architectural distortion or duct changes, it is beneficial for the diagnosis of malignant lesions. Compared to mammography examination, ABUS has higher sensitivity to malignant calcification, especially in dense breast, which is expected to become an effective supplementary examination method.

Optimizing off-treatment outcome predictions: The potential of time-varying HBcrAg and the need for more research

Ying-Nan Tsai, [1,2] Jia-Ling Wu, [3] and Yao-Chun Hsu [2,4]

our recent study published in *Clinical and Molecular Hepatology* [2] regarding the role of time-varying hepatitis B core-related antigen (HBcrAg) in predicting clinical relapse (CR) for chronic hepatitis B (CHB) patients who discontinued tenofovir or entecavir. We agree that nucleos(t) ide analogue (NA) cessation is generally safe with hepatitis B surface antigen (HBsAg) seroclearance [3], which is the only treatment endpoint widely acceptable across guidelines [4,5]. Unfortunately, it rarely occurs during long-term NA therapy [6]. Treatment discontinuation without first achieving HBsAg seroclearance invariably leads to recurrence of viremia and could precipitate hepatitis flare and even life-threatening acute on chronic liver failure [7]. The strategy of finite NA therapy, therefore, cannot be practiced witho thorough consideration of the conceivable benefits and potential risks for an individual patient.

Substantial research efforts have been devoted to identify suitable candidates for

In summary, our study demonstrated the clinical relevance of measuring serum HBcrAg during the follow-up of patients who stop NA therapy, and found that the most recent level was more accurate than a previous measurement to predict CR. Although the commercial assay lacks the sensitivity to detect nuances of serum HBcrAg below the lower limit of detection ranges, a HBcrAg level below 1,000 U/mL may still serve as a clinically useful cutoff for predicting CR. A more sensitive assays with a broader range of detection may improve the clinical utility of HBcrAg and refine the risk assessment based on its dynamic measurement. Finally, it remains largely unknown how to incorporate various risk predictor for optimizin posttreatment monitoring. Our novel findings should call for further studies.

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The predictive value of cardiovascular outcomes and mortality assessed by the C-reactive protein to albumin ratio in the UK Biobank

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Abstract

Background The C-reactive protein/albumin ratio (CAR) seems to mirror disease severity and prognosis in several acute disorders particularly in elderly patients, yet less is known about if CAR is superior to C-reactive protein (CRP) in the general population.

Methods Prospective study design on the UK Biobank, where serum samples of CRP and Albumin were used. Cox regression analyses were conducted to assess all-cause and cardiovascular mortality, myocardial infarction, ischemic stroke, and heart failure over a follow-up period of approximately 12.5 years. The Cox model was adjusted for established cardiovascular disease (CVD) risk factors, including age, sex, smoking habits, physical activity level, BMI level, systolic blood pressure, LDL-cholesterol, statin treatment, diabetes, and previous CVD, with hazard ratios (HRs) and corresponding 95% confidence intervals (CIs). Analyses were also stratified by sex, CRP level (< 10 and ≥ 10 mg/ml) and age (< 60 and ≥ 60 years).

Results In total, 411,506 individuals (186,043 men and 225,463 women) were included. In comparisons between HRs for all adverse outcomes, the results were similar or identical for CAR and CRP. For example, both CAR and CRP, adjusted HRs for all-cause mortality were 1.13 (95% CI 1.12–1.14). Regarding CVD mortality, the adjusted HR for CAR was 1.14 (95% CI 1.12–1.15), while for CRP, it was 1.13 (95% CI 1.11–1.15).

Conclusions Within this study CAR was not superior to CRP in predictive ability of mortality or CVD disorders.

Clinical trial registration number Not applicable (cohort study).

Keywords Cardiovascular mortality, Diabetes, Blood pressure, CRP, Albumin

bias, and the presence of a healthy volunteer effect.

Conclusion

CAR showed no superiority in predicting neither mortality nor CVD disorders over CRP alone. Thus, our findings do not provide additional support for the use of CAR for mortality prediction in elderly in clinical practice in the general population.

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Noninvasive models for the prediction of liver fibrosis in patients with chronic hepatitis B

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Yufeng Du[3*]

Abstract

Objective To evaluate the diagnostic accuracy of aspartate aminotransferase(AST)/ alanine transaminase (ALT), AST to platelet ratio index (APRI), fibrosis-4 score (FIB-4) and gamma-glutamyl transpeptidase to platelet count ratio (GPR) for hepatic fibrosis in patients with chronic hepatitis B (CHB).

Methods A total of 1210 CHB patients who underwent liver biopsy were divided into two groups: patients with no significant fibrosis (control group) and patients with significant fibrosis, and routine laboratory tests were retrospectively included. Logistic regression models were used for the prediction, and the area under the receiver operating characteristic (AUROC) was used to assess the diagnostic accuracy.

Results A total of 631 (52.1%) and 275 (22.7%) patients had significant fibrosis (≥ S2) and advanced fibrosis (≥ S3), respectively. The GPR showed significantly higher diagnostic accuracy than that of APRI, FiB-4, and AST/ALT to predict ≥ S2(significant fibrosis) and ≥ S3 fibrosis(advanced fibrosis), with an AUROC was 0.69 (95%CI: 0.66–0.71) and 0.72 (0.69–0.75), respectively. After stratified by the status of HBeAg (positive or negative), GPR, APRI, and FiB-4 showed improved predicting performance for significant fibrosis and advanced fibrosis in HBeAg positive patients, with the most significant improvement was shown for GPR in predicting significant fibrosis (AUROC = 0.74, 95%CI: 0.70–0.78).

Conclusions Among the four noninvasive models, GPR has the best performance in the diagnosis of hepatic fibrosis in CHB patients and is more valuable in HBeAg-positive patients.

Keywords Chronic hepatitis B, Liver fibrosis, Prediction, Noninvasive models.

need to be further validated in a multicenter study.

Conclusions

In conclusion, GPR has better diagnostic efficacy than APRI, FIB-4, and AST/ALT for the staging of liver fibrosis in patients with CHB, the predictive value of GPR for HBeAg positivity is better than that for HBeAg negativity, and GPR is a better alternative to liver tissue biopsy. In clinical practice, dynamic assessment of GPR can help determine patient prognosis as well as guide clinical treatment options.

Abbreviations

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Research Article

Macrophage-2-Binding Protein Glycosylation Isomer (M2BPGi) and AGAP Score as Markers of Noninvasive Test for Liver Fibrosis versus FibroScan in Chronic Hepatitis B Patients: A Retrospective Observational Study

Laila Kurnia Pramono,[1] **Anna Tjandrawati**,[1] **Dewi Kartika Turbawaty**,[1] **Tiene Rostini**,[2] **Muhammad Begawan Bestari**,[3] **Haryono**,[3] **Deny Budiman**,[4] and **Prapanca Nugraha**[4]

Background. Liver biopsy as the gold standard for assessing the degree and diagnosis of fibrosis still has significant drawbacks, which make the emergence of a much less invasive diagnostic marker possible. M2BPGi levels and the AGAP score, the two newest serological markers, are known to have good sensitivity for detecting liver fibrosis. This study is aimed at determining the validity of examining M2BPGi levels and AGAP scores on the Fibroscan examination as markers of noninvasive test for liver fibrosis in chronic hepatitis B patients. *Methods*. This is an observational, descriptive study with a retrospective design. This study used secondary data taken from medical records and blood specimen research materials of outpatients at the Hepatology Gastroenterology Polyclinic at a tertiary general hospital in West Java, Indonesia, with a diagnosis of chronic hepatitis B. *Results*. There were 109 research subjects included. There were 73 (66.9%) subjects with no- or low-grade fibrosis and 36 (33.1%) with advanced fibrosis. The sensitivity and specificity of the M2BPGi were 88.9% and 61.6% (PPV 55.3%; NPV 91.8%; AUC 0.753), while the AGAP score was 47.2% and 100% (PPV 100%; NPV 79.3%; AUC 0.736). The combined M2BPGi level and the AGAP score showed a sensitivity of 80.9% and a specificity of 100% (PPV 100%; NPV 91.8%; AUC 0.905). *Conclusion*. The AGAP score and M2BPGi levels together are a better way to measure the degree of liver fibrosis in onic hepatitis B than either M2BPGi or the AGAP score alone.

Table 7: Validity test for the combined examination of the M2BPGi levels and the AGAP score on the Fibroscan® examination in subjects who have not received or have received antiviral therapy.

		Grade Fibroscan (METAVIR Fibroscan)		
		Advanced fibrosis	No/low-grade fibrosis	
Have not received antiviral therapy	M2BPGi + AGAP score	$n = 9$	$n = 19$	Sensitivity: 77.8%
	Positive	7	0	Specificity: 100% Positive predictive value (PPV): 100%
	Negative	2	19	Negative predictive value (NPV): 90.5% Area under the ROC curve (AUC): 0.889
Have received antiviral therapy	M2BPGi + AGAP Score	$n = 12$	$n = 26$	Sensitivity: 83.3%
	Positive	10	0	Specificity: 100% Positive predictive value (PPV): 100%
	Negative	2	26	Negative predictive value (NPV): 92.9% Area under the ROC curve (AUC): 0.917

4. Conclusion

Examination of M2BPGi levels has high sensitivity but low specificity in estimating the extent of hepatic fibrosis in those with chronic hepatitis B. The AGAP score has high specificity but low sensitivity in estimating the extent of hepatic fibrosis in those with chronic hepatitis B. The combined examination of M2BPGi levels and the AGAP score has good validity in estimating the extent of hepatic fibrosis in those with chronic hepatitis B patients compared to the single parameter M2BPGi or AGAP score. Having a history of antiviral therapy does not increase the validity of the AGAP score. As clinicians, we can utilise the measurement of the M2BPGi or AGAP score for patients with hepatitis B

THE END