Evaluation of acoustic radiation force impulse (arfi) for fibrosis staging in chronic liver diseases

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Abstrak

Background: acoustic radiation force impulse (ARFI) is a new proposed noninvasive method for liver fibrosis staging. Integrated with B mode ultrasonography, ARFI can be used to assess liver tissue condition. However its diagnostic accuracy is still being continuously evaluated. Also, there is lack of data regarding the utilization of ARFI in our population. This study aimed to evaluate the diagnostic value of ARFI as an alternative noninvasive modality for fibrosis staging in chronic hepatitis B and hepatitis C patients in our population.
Methods: we conducted cross sectional comparison of ARFI imaging and transient elastography on patients who underwent liver biopsy at Cipto Mangunkusumo Hospital. Fibrosis staging using METAVIR scoring system presented as standard reference. A total of 43 patients underwent liver biopsy was evaluated by ARFI imaging and transient elastography. Cut off values were determined using receiver operating characteristic (ROC).
Results: both liver stiffness determined by ARFI and transient elastography (TE) were moderately correlated with METAVIR score with value of 0.581 and 0.613, respectively (both P<0.01). Diagnostic accuracy of ARFI predicted significant fibrosis (F>2) with area under receiver operating characteristic curve (AUROC) of 0.773 (95% CI 0.616-0.930) and even better for cirrhosis (F4 fibrosis), expressed as AUROC of 0.856 (95% CI 0.736-0.975). Transient elastography was better for significant fibrosis with AUROC of 0.761 (95% CI 0.601-0.920) and was best for prediction of cirrhosis, expressed as AUROC of 0.845 (95% CI 0.722-0.968).
Conclusion: ARFI is provided with more convenient evaluation of liver tissue condition, and its diagnostic accuracy is not significantly different from TE for staging liver fibrosis.
.....Latar belakang: acoustic radiation force impulse (ARFI) merupakan metode non invasif baru untuk penilaian derajat fibrosis hati. Dengan adanya integrasi ultrasonografi mode B, ARFI dapat digunakan untuk menilai kondisi jaringan hati. Meskipun demikian, kemampuan diagnostik ARFI saat ini masih terus dievaluasi. Terlebih lagi, belum tersedia data mengenai penggunaan ARFI pada populasi kami. Penelitian ini bertujuan mengevaluasi kemampuan diagnostik ARFI sebagai alternatif modalitas penilaian derajat fibrosis secara non invasif pada pasien hepatitis B dan hepatitis C kronik pada populasi kami.
Metode: dilakukan penelitian potong lintang untuk membandingkan gambaran ARFI dan elastografi transien pada pasien yang diperiksakan biopsi hepar di Rumah Sakit Cipto Mangunkusumo. Derajat fibrosis menggunakan sistem skor METAVIR sebagai acuan baku. Sebanyak 43 pasien diikutsertakan dalam penelitian ini. Nilai cut-off ditentukan berdasarkan kurva receiver-operating characteristic (ROC).
Hasil: derajat kekakuan hati melalui pemeriksaan ARFI maupun transien elastografi (TE) berkorelasi sedang dengan skor METAVIR dengan skor masing-masing 0,581 dan 0,613 (p<0,01). Akurasi diagnostik ARFI untuk memprediksi fibrosis signifikan (F2) memiliki area under receiver operating characteristic curve (AUROC) 0,773 (IK 95% 0,616-0,930) dan bahkan jauh lebih baik untuk sirosis (fibrosis F4), ditunjukkan

dengan AUROC 0,856 (IK 95% 0,736–0,975). Elastografi transien memiliki kemampuan diagnostik lebih baik untuk fibrosis signifikan dengan AUROC 0,761 (IK 95% 0,601–0,920) dan paling baik untuk prediksi sirosis, dengan AUROC 0,845 (IK 95% 0,722–0,968).
Kesimpulan: ARFI merupakan prosedur evaluasi kondisi jaringan hati yang lebih praktis, dengan akurasi kemampuan diagnostik yang tidak berbeda secara signifikan dengan elastografi transien untuk menentukan derajat fibrosis hati.