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Original article

Liver and spleen biometrics in childhood-onset systemic lupus erythematosus patients

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ABSTRACT

Objective: To evaluate liver and spleen dimensions in childhood-onset systemic lupus erythematosus (c-SLE) patients and healthy controls.
Methods: 30 c-SLE patients and 30 healthy control volunteers underwent abdominal ultrasound. The following two liver measurements were performed in left hepatic lobe: craniocaudal and anteroposterior and three in right hepatic lobe (RHL): posterior craniocaudal (PCC-RHL), anterior craniocaudal and anteroposterior. Three spleen dimension measurements were also evaluated: longitudinal, transverse and anteroposterior. Demographic, clinical and laboratorial data, SLEDAI-2K, ECLAM, SLAM and treatment were assessed.
Results: Mean current age was similar in c-SLE and controls (170.31 ± 27.81 vs. 164.15 ± 39.25 months; $p = 0.486$). The mean of PCC-RHL dimension was significantly higher in c-SLE compared to controls (13.30 ± 1.85 vs. 12.52 ± 0.93, $p = 0.044$). There were no differences between the other hepatic biometrics and splenic parameters ($p > 0.05$). Further analysis in c-SLE patients according to PCC-RHL dimension $\geq$13.3 cm versus <13.3 cm showed that the median of SLEDAI-2K [8 (0–18) vs. 2 (0–8), $p = 0.004$], ECLAM [4 (0–9) vs. 2 (0–5), $p = 0.019$] and SLAM [5 (1–13) vs. 2 (0–14), $p = 0.016$] were significantly higher in patients with higher PCC-RHL dimension, likewise the frequencie of nephritis (77% vs. 29%, $p = 0.010$). Liver enzymes were similar in both groups ($p > 0.05$). Positive correlation was observed between SLEDAI-2K and PCC-RHL ($p = 0.001$, $r = +0.595$). Negative correlation was evidenced between disease duration and longitudinal dimension of spleen ($p = 0.031$, $r = -0.394$).
Conclusion: Our data raises the possibility that disease activity could lead to a subclinical and localized hepatomegaly during the disease course. Long disease duration resulted to spleen atrophy in c-SLE patients.

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Biometria do fígado e do baço em pacientes com lúpus eritematoso sistêmico de início na infância

Palavras-chave:
Hepatomegalia
Atrofia do baço
Ultrassonografia
Biometria
Lúpus eritematoso sistêmico
Reumatologia pediátrica

RESUMO

Objetivo: Avaliar as dimensões do fígado e do baço em pacientes com lúpus eritematoso sistêmico de início pediátrico (LESp) e controles saudáveis.

Métodos: 30 pacientes com LES-i e 30 voluntários saudáveis controle foram submetidos a uma ultrassonografia do abdome. Foram realizadas duas medições do fígado no lobo hepático esquerdo (craniocaudal e anteroposterior) e três no lobo hepático direito (LHD) (craniocaudal posterior [CCP-LHD], craniocaudal anterior e anteroposterior). Foram também avaliadas três medidas das dimensões do baço: longitudinal, transversal e anteroposterior. Foram avaliados dados demográficos, clínicos e laboratoriais, SLEDAI-2K, ECLAM, SLAM e tratamento.

Resultados: A idade média foi semelhante nos pacientes com LES-i e controles (170,31 ± 27,81 vs. 164,15 ± 39,25 meses; $p = 0{,}486$). A média da dimensão CCP-LHD foi significativamente maior no grupo LES-i em comparação aos controles (13,30 ± 1,85 vs. 12,52 ± 0,93, $p = 0{,}044$). Não houve diferenças nos outros parâmetros biométricos do fígado e do baço ($p > 0{,}05$). Uma análise especifica realizada apenas nos pacientes com LESp de acordo com a dimensão CCP-LHD ≥13,3 cm versus <13,3 cm mostrou que a mediana do SLEDAI-2K [8 (0–18) vs. 2 (0–8), $p = 0{,}004$], ECLAM [4 (0–9) vs. 2 (0–5), $p = 0{,}019$] e SLAM [5 (1–13) vs. 2 (0–14), $p = 0{,}016$] era significativamente maior em pacientes com maior dimensão CCP-LHD, do mesmo modo que a frequência de nefrite (77% vs. 29%, $p = 0{,}010$). As enzimas hepáticas foram semelhantes nos dois grupos ($p > 0{,}05$). Foi observada uma correlação positiva entre o SLEDAI-2K e a dimensão CCP-LHD ($p = 0{,}001$, $r = +0{,}595$). Evidenciou-se uma correlação negativa entre a duração da doença e a dimensão longitudinal do baço ($p = 0{,}031$, $r = -0{,}394$).

Conclusão: Os dados levantam a possibilidade de que a atividade da doença pode levar a uma hepatomegalia subclínica e localizada durante o curso da doença. A duração da doença resultou em atrofia do baço em pacientes com LES-i.

Introduction

Hepatomegaly and/or splenomegaly occur in 20–50% childhood-onset systemic lupus erythematosus[1] (c-SLE) patients at disease onset, usually associated with disease activity. Involvement of the reticuloendothelial system may also be associated with abnormal liver function tests.[2,3]

Abdominal ultrasound can be used to assess liver[4] and spleen measurements in children and adolescents without risk of radiation.[5] However, a systematic evaluation of these visceral organ dimensions has not been performed in c-SLE population, particularly during the disease course.

Therefore, the objectives of our study were to evaluate liver and spleen dimensions in c-SLE patients and healthy controls and to assess possible associations between abnormalities in liver and spleen sizes with demographic data, clinical features, disease activity, cumulative damage and treatment.

Materials and methods

Patients and controls

From May to June 2012, 58 c-SLE patients were followed at our Pediatric Rheumatology Service. All of the patients fulfilled the American College of Rheumatology criteria for c-SLE.[6] The exclusion criteria were current acute or chronic infections, autoimmune hepatitis, other concomitant disease with hepatosplenomegaly, cancer or unwilling to participate. Out of them, 15 were excluded due to current acute infections, 9 due to unwillingness to participate and 4 due to autoimmune hepatitis. Therefore, the cross-sectional study was conducted in 30 c-SLE patients. The control group included 30 healthy control volunteers recruited from the primary care clinic nearby our tertiary hospital. The control volunteers were submitted to clinical evaluation, and liver and spleen biometrics. Local ethics committee of our university hospital approved this study, and informed consent was obtained from all participants.

Liver and spleen biometrics

Abdominal ultrasound was carried out by an experienced and trained, specialist (SMS) using a 1–6 mHz convex multifrequency transducer (LOGIC E9® – General Electric, USA). The following two liver measurements were performed in left hepatic lobe (LHL): craniocaudal (CC-LHL) and anteroposterior (AP-LHL), and three in right hepatic lobe (RHL): posterior craniocaudal (PCC-RHL), anterior craniocaudal (ACC-RHL) and anteroposterior (AP-RHL). Three spleen dimension