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原发性自身免疫性肝硬化的超声图征象及肝脏弹性的分析*

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摘要 目的:探讨与分析原发性自身免疫性肝硬化的超声图征象及肝脏弹性特征。**方法:**研究时间为2017年2月至2019年12月,选择原发性自身免疫性肝硬化86例作为病例组,同期选择正常志愿者86例作为对照组,所有入选者都给予常规超声与弹性成像,记录成像特征并判断相关性。**结果:**病例组的全血谷草转氨酶(aspartate aminotransferase, AST)、谷丙转氨酶(alanine transaminase, ALT)、直接胆红素(direct bilirubin, DBIL)、总胆红素(total bilirubin, TBIL)与碱性磷酸酶(Alkaline phosphatase, ALP)值都显著高于对照组($P<0.05$)。病例组的肝脏回声、边界、内回声、血流等超声特征与对照组对比差异都有统计学意义($P<0.05$)。病例组肝脏组织剪切波速度(shear wave velocity, SWV)、肝硬度高于对照组,应变率比值(Strain rate, SR)值低于对照组,对比差异都有统计学意义($P<0.05$)。病例组的肝脏弹性硬度分级与对照组对比差异有统计学意义($P<0.05$)。在病例组中, Pearson 分析显示肝脏弹性硬度分级与肝脏回声、边界、内回声、血流等存在相关性($P<0.05$)。**结论:**常规超声及肝脏弹性可反映原发性自身免疫性肝硬化的临床特征,两者存在相关性,可提高该病的鉴别诊断水平。

关键词:超声;肝脏弹性;原发性自身免疫性肝硬化;硬度;剪切波速度

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Ultrasound Signs of Primary Autoimmune Cirrhosis and Analysis of Liver Elasticity*

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ABSTRACT Objective: To explore and analysis the ultrasound signs and liver elasticity of primary autoimmune liver cirrhosis.

Methods: The study period were from February 2017 to December 2019. 86 cases of primary autoimmune liver cirrhosis were selected as the case group, and 86 cases of normal volunteers were selected as the control group. All the cases were given conventional ultrasound and elastic Imaging, recording imaging features and judging correlation. **Results:** The whole blood AST, ALT, DBIL, TBIL and ALP values in the case group were significantly higher than those in the control group ($P<0.05$). The ultrasound characteristics of liver echo, border, internal echo, and blood flow in the case group were significantly different from those in the control group ($P<0.05$). The liver tissue shear wave velocity (SWV) and liver stiffness in the case group were higher than in the control group, and the SR value were lower than that in the control group that compared the differences were statistically significant ($P<0.05$). There were statistically significant difference in liver elasticity hardness compared between the case group and the control group ($P<0.05$). In the case group, Pearson analysis showed that there were correlation between liver elastic stiffness grade and liver echo, boundary, internal echo, blood flow ($P<0.05$). **Conclusion:** Routine ultrasound and liver elasticity can reflect the clinical characteristics of primary autoimmune liver cirrhosis. There are correlation between the two, which can improve the differential diagnosis of the disease.

Key words: Ultrasound; Liver elasticity; Primary autoimmune cirrhosis; Stiffness; Shear wave velocity

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前言

原发性自身免疫性肝硬化是一类由于机体自身免疫反应过度造成肝硬化,从而出现肝功能异常^[1]。随着医学诊断技术的提高,该病的发病率也不断上升,但是具体的病因与发病机制还不明确^[2]。原发性自身免疫性肝硬化在病理上主要表现为门静脉炎症与肝内非化脓性小胆管破坏,然后可逐渐进展为肝

纤维化、肝衰竭、肝癌等^[3,4]。早期原发性自身免疫性肝硬化是延缓和控制疾病的进展与延长生存期的关键^[5]。不过该病多合并自身免疫性疾病,包括类风湿关节炎、自身免疫性甲状腺疾病、干燥综合征,从而给疾病诊断带来了一定的难度^[6,7]。超声诊断具有简单、分辨等特点,但是诊断的特异性有待提高。超声弹性成像是通过对组织进行加压,受压的靶组织产生形变,利用超声技术可得到该组织的硬度信息^[8,9]。特别是当超声作用于肝脏

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组织并在组织内部传播,可产生一个振动幅度,从而可反映肝脏组织状态^[10]。特别是当前的超声技术可获取多个感兴趣区域内的弹性状况,可实时显示常规二维图像、弹性图像,可以检测出感兴趣区域内的任何大小区域的弹性测值^[11,12]。本文探讨了原发性自身免疫性肝硬化的超声图征象及肝脏弹性特征,并分析了相关性。现总结报道如下。

1 资料与方法

1.1 研究对象

研究时间为2017年2月至2019年12月,研究得到了医院伦理委员会的批准与所有入选者的知情同意。

对照组:正常志愿者86例,纳入标准:实验室检查肝胆系

统未见明显异常者;无病毒性肝炎、肝硬化、肝占位性病变史。

病例组:原发性自身免疫性肝硬化86例,纳入标准:符合原发性自身免疫性肝硬化的诊断标准(肝脏组织学表现为非化脓性胆管炎和小叶间胆管破坏,抗线粒体抗体(Antimitochondrial antibody, AMA)阳性或抗线粒体抗体M2亚型阳性(AMA-M2),碱性磷酸酶(Alkaline phosphatase, ALP)升高)。

两组排除标准:妊娠与哺乳期妇女;超声图像不清晰者;临床资料缺乏者;不配合检查者;合并严重心脏、肾脏等系统异常者;门静脉、肝静脉或胆管等癌栓形成者。

两组入选者的性别、年龄、体重指数等资料对比差异无统计学意义($P>0.05$)。见表1。

表1 两组一般资料对比

Table 1 Comparison of two groups of general information

Groups	n	Gender (Male/ Female)	Age (Year)	BMI (kg/m ²)
Case group	86	31/55	51.86±4.01	22.49±2.15
Control group	86	28/58	52.41±3.98	22.98±1.77

1.2 超声方法

1.2.1 常规超声 采用西门子公司 Acuson S2000 彩色多普勒超声诊断仪凸阵探头,频率4-8 MHz,自带实时组织弹性成像及分析软件。患者取平卧位,记录肝脏组织的回声、边界、内回声等性质,边界分为清晰、不清晰等,回声性质分为高回声、低回声、等回声等,内回声分为不均匀、均匀等,后用彩色多普勒超声显示肝脏血流,记录血流状况。常规超声检查由一位具有5年以上腹部超声检查经验的高年资主治医师或者副主任医师完成。

1.2.2 肝脏弹性超声 在腹部常规超声检查后,由相同资历的检查者行超声肝脏弹性成像检查,在同一切寻找显示肝脏最佳切面,稳住探头,进入声辐射力脉冲成像状态,启动声触诊组织成像技术,注意避开肉眼可见的瘢痕区域或坏死区域。嘱咐患者屏住呼吸,选择合理的取样框,探头的声束与取样框尽可能保持平行,最大取样深度8 cm,取样框大小固定1.0×0.5 cm,放置于感兴趣区(region of interest, ROI)内,弹性图像显示彩色充填良好时为最佳图像,冻结并存储图像。测量两组感兴趣区组

织都是SWV,并记录肝硬度与SR值。

弹性图像硬度分级:A级:感兴趣区与周边组织呈均匀的绿色;B级:感兴趣区绿蓝相间,以绿色为主;C级:感兴趣区蓝绿相间,以蓝色为主;D级:感兴趣区全为蓝色覆盖。

1.3 临床调查

所有入选者空腹8 h以上抽血检查,记录AST、ALT、DBIL、TBIL、ALP等值。

1.4 统计方法

应用SPSS 19.00,计量资料以($\bar{x} \pm s$)表示,对比为t检验,计数数据以样本率进行表示,对比采用卡方分析,相关性分析采用Pearson分析, $P<0.05$ 差异有统计学意义。

2 结果

2.1 常规生化指标对比

病例组的全血AST、ALT、DBIL、TBIL与ALP值都显著高于对照组($P<0.05$)。见表2。

表2 两组常规生化指标对比($\bar{x} \pm s$)

Table 2 Comparison of routine biochemical indicators between two groups($\bar{x} \pm s$)

Groups	n	AST(U/L)	ALT(U/L)	DBIL(μmol/L)	TBIL(μmol/L)	ALP(U/L)
Case group	86	92.44±7.33*	75.98±2.56*	34.14±4.19*	38.98±1.49*	211.98±19.48*
Control group	86	23.98±4.11	30.09±3.14	12.78±2.14	18.99±2.10	43.87±5.15

Note: Compared with the control group, * $P<0.05$, same as below.

2.2 常规超声特征对比

病例组的肝脏回声、边界、内回声、血流等超声特征与对照

组对比差异都有统计学意义($P<0.05$)。见表3。

表3 两组肝脏常规超声特征对比(例,%)

Table 3 Comparison of routine ultrasound features of the liver between the two groups (n,%)

Groups	n	Echo (high / equivalent / low)	Boundary (unclear / clear)	Internal echo (uneven / uniform)	Blood flow (rich / lacking)
Case group	86	14/20/52*	56/30*	49/37*	56/30*
Control group	86	45/30/11	11/75	14/72	16/70

2.3 肝脏弹性指标对比

对照组($P<0.05$)。见表 4。

病例组肝脏组织 SWV、肝硬度高于对照组,SR 值低于对

表 4 两组肝脏弹性指标对比($\bar{x}\pm s$)

Table 4 Comparison of liver elasticity index between two groups ($\bar{x}\pm s$)

Groups	n	SWV (m/s)	Liver stiffness (kPa)	SR
Case group	86	1.53±0.14*	13.09±2.14*	5.08±0.33*
Control group	86	1.09±0.22	10.00±1.47	8.38±0.44

2.4 硬度分级对比

意义($P<0.05$)。见表 5。

病例组的肝脏弹性硬度分级与对照组对比差异有统计学

表 5 两组肝脏弹性硬度分级对比 (例,%)

Table 5 Comparison of liver elastic hardness classification between two groups (n,%)

Groups	n	A	B	C	D
Case group	86	9*	20	45*	12*
Control group	86	60	21	5	0

2.5 相关性分析

回声、边界、内回声、血流等存在相关性($P<0.05$)。见表 6。

在病例组中,Pearson 分析显示肝脏弹性硬度分级与肝脏

表 6 原发性自身免疫性肝硬化的超声图征象与肝脏弹性的相关性(n=86)

Table 6 Correlation between ultrasound signs of primary autoimmune cirrhosis and liver elasticity (n = 86)

Index	Echo	Boundary	Inner echo	Blood flow
r	0.533	0.498	0.671	0.711
P	0.010	0.016	0.000	0.000

3 讨论

原发性自身免疫性肝硬化为常见的自身免疫性肝病^[13]。但是该病与其他免疫性疾病常重叠发病,导致临床症状表现不十分明显^[14]。已有研究显示合并其他自身免疫疾病者占原发性自身免疫性肝硬化患者总数的一半左右,包括合并干燥综合征、类风湿关节炎、弥漫性结缔组织病、系统性硬化病等^[15]。也可反映原发性自身免疫性肝硬化多为隐源性起病,单独存在时常不易被重视^[16]。本研究显示病例组的全血 AST、ALT、DBIL、TBIL 与 ALP 值都显著高于对照组;病例组的肝脏回声、边界、内回声、血流等超声特征与对照组对比差异都有统计学意义,反映了临床实际情况。但是上述特征与肝癌、肝衰竭患者间无差异,不同检查者所判断的超声特征会有一定差异,导致诊断效果不佳^[17,18]。

本研究显示病例组肝脏组织 SWV、肝硬度高于对照组,SR 值低于对照组,对比差异都有统计学意义。超声弹性成像技术是属于振动性弹性成像技术,包括声触诊组织成像技术和声触诊组织定量技术等,其需要先确定探测组织弹性的感兴趣区,对感兴趣区发射推进脉冲波并产生局部位移,最后得到组织硬度灰阶图^[19]。并且该方法可由特定的电子系统计算出剪切波的传播速度,从而可估计组织弹性模量^[20]。超声弹性成像能较准确反映组织的硬度,当组织内有硬化异常时,组织的弹性就会发生一定变化,因而可应用于疾病的诊断^[21]。其中 SR 法是一种以比值的形式评估组织相对硬度的方法,在甲状腺结节、乳

腺肿块的鉴别诊断中发挥了重要的价值。并且该方法可由仪器自动给出弹性成像数据,可提高超声成像的可信度和临床实用性^[22,23]。

本研究显示病例组的肝脏弹性硬度分级与对照组对比差异有统计学意义。原发性自身免疫性肝硬化是一类免疫介导的,以肝脏为靶器官的器官特异性自身免疫疾病,该病多呈隐匿性、慢性化表现,与慢性炎症性肝病难以区分,往往导致患者病情恶化,从而出现肝癌、肝衰竭等,给患者以及家属带来沉重的身心与经济负担^[24,25]。超声弹性成像技术可收集被测物体某时间段内的各个信号片段,可估计组织内部不同位置的位移与变形程度,再以彩色编码成像^[26]。弹性系数中等的组织显示为绿色,弹性系数大的组织受压后可变为蓝色,从而可反映感兴趣从“软”到“硬”的程度^[27]。

本研究 Pearson 分析显示原发性自身免疫性肝硬化患者的肝脏弹性硬度分级与肝脏回声、边界、内回声、血流等存在相关性。原发性自身免疫性肝硬化属于自身免疫性肝病的一种,多发病于中年女性,但是存在地域和种族间的差异^[28,29]。从机制上分析,生物组织的弹性与肝脏的生物学特性紧密相关,反映的是有关组织内部弹性特征的新信息,而这种信息是鉴别肝脏组织病变性质的重要参数^[30,31]。本研究也存在一定的不足,样本数量较少,没有对肝衰竭与肝癌组织进行分析,可能存在研究偏差,将在后续研究中深入探讨。

总之,常规超声及肝脏弹性特征信息可反映原发性自身免疫性肝硬化的临床特征,两者存在相关性,可提高该病的鉴别

诊断水平。

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