Study on Histopathological Classification of Chronic Viral Hepatitis

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Abstract: Chronic viral hepatitis and post-hepatitis cirrhosis are common and frequently-occurring diseases that seriously endanger the health of our people. Early evaluation of liver disease activity and fibrosis degree in patients with hepatitis is conducive to early clinical intervention measures to delay and prevent the progression of chronic hepatitis to cirrhosis. Magnetic resonance diffusion-weighted imaging (DWX) is currently known as a noninvasive imaging method that can reflect certain physiological and pathological characteristics of liver tissue structure by detecting the microscopic diffusion motion state of water molecules in liver tissue. The manifestation of the severity of diffuse viral hepatitis and explore its relationship with pathological grade

1. Introduction

Chronic viral hepatitis and post-hepatitis cirrhosis are common and frequently-occurring diseases that seriously endanger the health of our people. During the course of hepatitis, hepatocyte degeneration, necrosis, regeneration and fibrous hyperplasia occur repeatedly, which gradually cause hepatic lobular structure reconstruction and destruction, and the formation of pseudolobules, causing liver fibrosis and liver parenchymal damage. When patients with chronic hepatitis and carriers of hepatitis virus develop liver fibrosis, there can be no clinical symptoms, and liver function serology can also be basically normal. Early evaluation of the activity of liver lesions and the degree of fibrosis of hepatitis virus carriers is conducive to early clinical interventions to delay and stop the progression of chronic hepatitis to cirrhosis. How to easily and effectively monitor the severity of hepatitis has become a hot and difficult point in liver disease research. At present, liver biopsy is the accepted gold standard for diagnosing the inflammation, necrosis and fibrosis of chronic viral hepatitis. In 1981, a semi-quantitative integral system was established to evaluate liver inflammation, necrosis and fibrosis, known as the Histology Activity Index (HAI) integral system, which established a good connection with the traditional histological description of liver pathological specimens. Now, the HAI points system has become an internationally accepted standard for pathological evaluation of liver inflammation, necrosis and fibrosis. However, liver biopsy is an invasive examination, with a 0.3% complication rate and 0.018% mortality. There are also problems with tissue sampling errors, evaluation criteria and reader experience, especially repeatability and patient acceptance. The problem seriously affected the widespread application of liver biopsy. Other clinical indicators, such as the patient's clinical symptoms, routine biochemical examinations, hematological examinations, and serum marker detection, cannot accurately assess the degree of inflammatory necrosis and fibrosis of the diseased liver. Therefore, there is an urgent need for a simple, non-invasive and repeatable method to evaluate the severity and evolution of liver inflammation and necrosis and fibrosis, and to monitor the therapeutic effect.

2. Research Objects

From July 2006 to December 2007, 49 patients with chronic viral hepatitis or hepatitis virus carriers who underwent liver biopsy in the Department of Infectious Diseases or Infectious Diseases of West China Hospital of Sichuan University were collected and examined by DWI 1-7 days before liver biopsy. All patients had no contraindications for magnetic resonance examination and no other serious comorbidities (such as malignant tumors, diabetes, diffuse renal insufficiency, arrhythmia or heart failure, etc.), and M rent examination had no liver occupying lesions. All

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patients underwent MRI scan after signing informed consent. The duration of hepatitis or the discovery of hepatitis virus markers ranged from 10 days to 33 years, with an average of 6.5 years. 44 cases were clinically confirmed as chronic hepatitis B patients or hepatitis B virus carriers, including: HBsAg (+), HBeAg (+) combined with Anti-HB. (+) 18 cases; HBsAg(+), Anti-HBe(+) combined Anti-HBc(+) 20 cases; HBsAg(+) combined Anti-HBc(+) 5 cases; HBsAg(+) combined HBeAg (+) One case. Five of the hepatitis C virus markers were positive, and 3 of them had a history of blood transfusion. Twelve patients had no clinical symptoms, and the remaining 37 patients had one or more manifestations of liver discomfort, abdominal distension, fatigue, anorexia, oil distress, jaundice, yellow urine, and thin stool. Two patients underwent splenectomy one year and 13 years ago, one underwent cholecystectomy two years ago, and one underwent cesarean section 9 years ago. The remaining 45 patients had no history of abdominal surgery. At the time of admission, 38 patients had abnormal liver function parameters. There were 36 males and 13 females in this group, aged 18-60 years, with an average of 34.8±8.0 years. 1.2 Control group: To exclude confounding factors of age, 10 normal young people and middle-aged people were included in this study as normal controls. There were 4 males and 6 females, aged 23-55 years, with an average of 30.1±0.1 years. Inclusion criteria: healthy people who voluntarily accepted the M class examination of the upper abdomen, and signed an informed consent; no history of liver disease and history of severe systemic disease (such as malignant tumor, diabetes, chronic renal insufficiency, arrhythmia or heart failure, etc.); Recent (within 1 year) liver function biochemical examination and hepatitis marker examination to exclude liver function damage and viral hepatitis carry; ④Recent liver B-ultrasound or M rent examination did not find diffuse or focal lesions; No long-term mass History of drug use; no history of alcoholism; no contraindications for magnetic resonance examination.

3. Detection Method

Both the case group and the normal group were scanned using the GE Sig na-ex cite 3.0T superconducting magnetic resonance imaging system. The subjects were fasted for more than 4 hours before the examination, trained to breathe, and weighed. The T1W and T2W axial scans were performed first, using 8US TORSO PA abdominal coil, supine position, and the scanning range was from the diaphragm top to the lower liver pole or lower splenic pole (splenomegaly). Scanning parameters: ① Fast SPG R sequence of breath-hold gradient echo to obtain T1 weighted image, TR 170 ms, TE 2.1 ms, flip angle 75°, bandwidth 62.5 Hz, matrix 320 ×192, NEX 1, FOV300 mm ×300 mm ~ 400 mm × 400 mm, the number of layers is 18, the thickness of the layer is 8 mm, the interval is 2 mm, and the breath is collected in 2 times. ②Respiratory gating fast spin echo FRFSE-XL sequence to obtain T2-weighted images, fat suppression, TR 1 000 ms, TE 85 ms, bandwidth 62.5 Hz, matrix 320 ×224, NEX 2, FOV 30 ~ 40 cm, number of layers 20, layer thickness 8 mm, spacing 2 mm. DWI adopts single-shot spin-echo technique (single-shot spin-echo), TR /TE = 1 000 ms/35. 8 ms, layer thickness 8 mm, interval 2 mm. FOV27 ~ 30 cm, matrix 128 × 130, applying a diffusion gradient in the Z axis direction. Diffusion scanning takes 4 diffusion sensitivity coefficient b values, respectively 100, 400, 600 and 800 s/mm2, each b value patient can get 6 to 10 cross-sectional images with a single breath hold, and the scanning time is 24 s.

Use GE Advantage Wo rkstation 4.2 for post-processing on the workstation. Take the region of interest on each layer of images obtained from each b value of each subject. The region of interest is round or oval, with pixels between 90 and 100, placed in the right lobe of the liver, avoiding large blood vessels as much as possible Branching and chemical shift artifacts. The ADC value in the region of interest is directly obtained, and the average value is obtained, that is, the average value of the ADC under each b value. The average ADC value of the liver in this study is expressed as mean ± standard deviation. SPSS 10.1 statistical software was used for data processing, t test and analysis of variance were used for statistical method, and the test level was $\alpha=0.05$.

4. Discussion of Analysis Results

All subjects in each group were given dispersion-weighted images and dispersion coefficient maps, and the images were clear. As the b value increases, whether it is a normal group or a hepatitis patient, the ADC value gradually decreases. The ADC value of hepatitis patients was slightly lower than that of the normal group, but the difference was not statistically significant (P>0.05). The A DC value of patients with liver fibrosis and those without fibrosis decreased with the increase of b value, and the ADC value of each fibrosis patient indicated by each b value was smaller than that without fibrosis, at b = 800 s/mm2 At the time, the difference was statistically significant (P=0.008), while the remaining b-values were not statistically significant at the two groups (P>0.05).

At different b values, patients with chronic hepatitis are graded according to the inflammatory activity scores. The changes in ADC values between different grades are shown in Table 3 and attached drawings. The results show that in the same-level, the larger the b value, the smaller the ADC value; under the same-b value, as the integration level increases, the ADC value gradually decreases; when the b value is 600 and 800 s/mm2 , The difference of ADC value of each level is statistically significant (P=0.025, P=0.006). When the b value is 800 s/mm2, there is no statistically significant difference in liver ADC values between the low level (level 1 and level 2) and the high level (level 3 and level 4), but between the low level and high level There was a statistically significant difference (level 1 and level 3, level 1 and level 4, level 2 and level 3, level 2 and level 4) (P values were 0.09, 0.03, 0.041 and 0. 002).

Under different b values, according to the fibrosis score, the change rule of ADC value in patients with chronic hepatitis is determined as shown in Table 4 and attached drawings. The result is that in the same-integral, as the b value increases, the ADC value decreases; under the same-b value, the higher the fibrosis integral, the lower the b value, where only at b = 800s/mm2, this difference has Statistical significance (P=0.001). Further comparison between the two points, the results show that the difference between the low points (0 points and 1 point) and the high points (3 points and 4 points) A DC value is not statistically significant, while the low points and high points Differences in ADC values between points (0 and 3 points, 0 and 4 points, 1 and 3 points, 1 and 4 points) are statistically significant (P values are 0.006 and 0.002, respectively) 043 and 0.030).

Chronic viral hepatitis has a high incidence in my country, which is a group of infectious diseases caused by hepatitis virus, with the main lesions of liver parenchymal cell degeneration and necrosis. Its typical pathological characteristics are the increasing aggravation of hepatocyte necrosis, inflammatory changes (measured by the aforementioned inflammatory activity grade) and fibrosis (measured by the aforementioned fibrosis score). In the early stage of the disease, the hyperplastic fibrous tissue formed small slivers, but it has not been connected to form a space and remodeled the lobule. This is called liver fibrosis, which is still a reversible disease. In theory, if the cause is eliminated, fibrosis can gradually absorb. However, if the lesion repeatedly fluctuates, the fibrosis process continues to progress, and the fibrous spaces in the central area of the leaflet and the manifold area are connected to each other, so that the leaflet structure and blood circulation are reconstructed to form liver cirrhosis, and the disease is irreversible. In clinical treatment, there is an urgent need for the diagnosis of inflammatory activity of chronic hepatitis, especially fibrosis stage, but there is no reliable index for staging the degree of fibrosis in current routine laboratory tests. Existing conventional imaging examination methods, including ultrasound, CT and conventional M RI can only be diagnosed after the liver morphology changes after liver cirrhosis, it is impossible to measure the degree and stage of liver fibrosis, and it is impossible to study at the molecular level Liver tissue structure and functional status. Therefore, it is generally believed that liver biopsy is the gold standard for assessing the degree of liver inflammation and fibrosis, but the biopsy is invasive, and the small liver tissue obtained by the puncture needle does not represent the degree of fibrosis of the entire liver. In addition, there are various problems such as sampling failure and differences in pathologist diagnosis. Therefore, we urgently need a simple, accurate and non-invasive method to assess the severity and grade of chronic viral hepatitis. Magnetic resonance diffusion-weighted

imaging (DWI) is a new technology of magnetic resonance imaging, which belongs to the category of functional imaging and is currently the only known method that can measure the molecular diffusion motion on a living body. The role of DWI in the early diagnosis of central nervous system ischemic diseases has been recognized. With the development of planar echo technology and the application of pulsed gradient magnetic field (M PG) spin echo technology, patients have a single breath hold Multiple images can be obtained, which allows DWI technology to be used for liver disease research.

5. Conclusion

This article uses DWI to study the performance of chronic viral hepatitis of different severity. Selecting the right anterior lobe study at the same site as the liver, found that the ADC value at high b value was statistically different between the fibrosis group and the non-fibrosis group; different inflammatory activity grades and fibrosis in the intestinal oden score system The difference is statistically significant in stages; the difference is statistically significant in patients with different Child-Pugh grades of hepatitis. ADC values at b=400, 600, 800s/mm^2 were negatively correlated with hepatitis inflammation grade and fibrosis stage, b=800s/mm^2 112 days inch ADC value had the highest correlation coefficient with hepatitis pathology grade, 0.470 and 0.659 respectively , Higher than ALT, AST, ALB, A/G, Child-Pugh classification and other laboratory and clinical indicators, higher than the liver parenchyma signal uniformity, lymph node enlargement and other imaging indicators. The b=800s/mm^2 was selected for the study. The ADC cut-off values of `diffuse viral hepatitis inflammation grade were Gl/G: 0.00131, GZ/G: 0.00131, G3/G40.00223, and the cut-off value of fibrosis stage was S. /S, 0.00127, S, /S: 0.00126, 53/540.00125, sensitivity 55.6-100%, specificity 72.7-100%.

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