Online Submissions: wjg.wjgnet.com
wjg@wjgnet.com
doi:10.3748/wjg.15.4070

World J Gastroenterol 2009 August 28; 15(32): 4070-4074
World Journal of Gastroenterology ISSN 1007-9327
© 2009 The WJG Press and Baishideng. All rights reserved.

CASE REPORT

"Pseudotumoral" hepatic pattern in acute alcoholic hepatitis: A case report

Andrea Tenca, Sara Massironi, Agostino Colli, Guido Basilisco, Dario Conte

Andrea Tenca, Sara Massironi, Guido Basilisco, Dario Conte, Policlinico, Mangiagalli, Regina Elena Foundation, Gastrointestinal Unit 2 and Postgraduate School of Gastroenterology, Università degli Studi di Milano, F. Sforza st. 35, 20122 Milan, Italy
Agostino Colli, Department of Internal Medicine, Ospedale "A. Manzoni", Lecco 23900, Italy
Author contributions: Tenca A, Massironi S, Colli A, Basilisco G and Conte D contributed equally to this work; Tenca A, Massironi S and Conte D wrote the paper.
Correspondence to: Dario Conte, MD, Policlinico, Mangiagalli, Regina Elena Foundation, Gastrointestinal Unit 2 and Postgraduate School of Gastroenterology, Università degli Studi di Milano, F. Sforza st. 35, 20122 Milan, Italy. dario.conte@unimi.it
Telephone: +39-2-55033418 Fax: +39-2-55033644
Received: March 14, 2009 Revised: July 17, 2009
Accepted: July 24, 2009
Published online: August 28, 2009

Abstract

In acute alcoholic hepatitis (AAH), a "pseudotumoral" appearance of the liver parenchyma on computed tomography (CT) scan has been reported. The main findings are hypervascularized areas closely similar to those observed in large hepatocellular carcinomas. We report a case of a patient affected by AAH with an unusual appearance of these "pseudotumoral" areas on CT scan, close resembling a metastatic cancer rather than a primary hepatocellular carcinoma. In fact, in contrast with previous reports, the picture was characterized by the presence of many inhomogeneous, hypoattenuated areas highlighted during both pre- and post-contrast phases. Moreover, we report the first description of "pseudotumoral" lesions on ultrasound scan. This patient was successfully treated with corticosteroids, even if many controversies still exist regarding their efficacy in this setting.

© 2009 The WJG Press and Baishideng. All rights reserved.

Key words: Acute alcoholic hepatitis; Pseudotumoral hepatic lesions; Alcoholic liver disease; Computed tomography; Ultrasound

Peer reviewers: Luigi E Adinolfi, Professor, Division of Internal Medicine & Hepatology, Seconda Università di Napoli, Facoltà di Medicina e Chirurgia, Via Cotugno, 1 (c/o Ospedale Gesù e Maria), 80135 Naples, Italy; Silvia Sookoian, MD, PhD, Instituto de Investigaciones Medicas, Alfredo Lanari, CONICET, Laboratorio de Hepatologia Clinica y Molecular, Departamento de Genetica y Biologia Molecular de Enfermedades Complejas, Universidad de Buenos Aires, Combatientes de Malvinas 3150 (1427), Buenos Aires, Argentina

Tenca A, Massironi S, Colli A, Basilisco G, Conte D. "Pseudotumoral" hepatic pattern in acute alcoholic hepatitis: A case report. *World J Gastroenterol* 2009; 15(32): 4070-4074 Available from: URL: http://www.wjgnet.com/1007-9327/15/4070.asp DOI: http://dx.doi.org/10.3748/wjg.15.4070

INTRODUCTION

Alcoholic liver disease (ALD) represents a common cause of morbidity and mortality in Europe and United States, its clinical manifestations ranging from fatty liver to end-stage cirrhosis. In this context, acute alcoholic hepatitis (AAH) is a serious complication, with a short-term mortality rate exceeding 50% in most severe cases[1-4]. Liver biopsy maintains its pivotal role in diagnosing AAH, in predicting its outcome and in the selection of patients suitable for treatment: steatosis, ballooning degeneration, Mallory bodies, perivenular polymorphonuclear inflammation and "chicken-wire" fibrosis represent the most frequent findings[5].

In the setting of AAH, imaging studies do not confirm the presence of ALD, but can be used to evaluate hepatic parenchymal changes. Ultrasonography (US) scan, computed tomography (CT) scan, and magnetic resonance imaging (MRI) can be used to diagnose fatty changes, cirrhosis or neoplastic diseases of the liver.

On MRI, specific features suggestive for alcoholic cirrhosis versus virus-induced cirrhosis include a higher volume index of the caudate lobe, smaller size of regenerative nodules of the liver and more frequent visualization of the right posterior hepatic notch[6]. On US liver scan, the presence of "pseudoparallel channel signs" and of low hepatic artery resistivity index (RI) at duplex Doppler investigation have both been reported in AAH[7-9]. A "pseudotumoral" hepatic pattern at CT scan has also been reported in this setting, even if only scanty data are available[10]. Advanced fibrosis can be

determined using transient elastography[11].

The present case report refers to an AAH patient with unusual pseudotumoral US and CT scan hepatic pattern, with favourable clinical course after alcohol withdrawal and steroid treatment.

CASE REPORT

A 33-year-old man, immigrating from Bangladesh, was referred to our Gastrointestinal Unit on August 9, 2007 because of marked asthenia, nausea, vomiting, abdominal pain and weight loss of 11 kg (from 66 to 55 kg for 170 cm of height) during the previous month. Blood arterial pressure was 105/70 mmHg and heart rate 80 beats per minute. The state of consciousness was normal and the physical examination revealed a painful hepatomegaly, with the lower hepatic edge 20 cm below the right costal margin. His past history revealed heavy smoking, accounting for a lifetime packet sum of 1800, and daily alcohol intake of 60 g until 2005; alcohol intake was then denied until hospital admission. His laboratory tests are reported in Table 1 (left column). Past or current HBV, HCV and HIV infections were ruled out by determining HBsAg and anti-HBc (tested with commercial electrochemiluminescence immunoassay kits-Elecsys HBsAg, anti-HBc; Roche Diagnostics, GMBH, Manheim, Germany), anti-HCV (Innotest-HCV-Ab IV; Innogenetics, Ghent, Belgium) and anti-HIV (tested with chemiluminescence immunoassay, Ag/Ab Combo-Architect, Abbott, Chicago, Illinois, USA). Serological and stool tests for parasitic infections were negative. Anti-nuclear, anti-mitochondrial and anti-LKM antibody were searched for by indirect immunofluorescence performed on 4 μm cryostat sections from rat liver, kidney and stomach tissues, at a sera dilution of 1:40. ECG and chest X rays were negative. US liver scan revealed a severe derangement of hepatic structure, characterized by multiple micro- and macronodular hyperechoic lesions; the biliary tree was not dilated and there were no signs of portal hypertension. Color-Doppler examination showed intrahepatic arterial dilation with pseudoparallel channel sign and low hepatic artery RI (Figure 1). At total body CT scan there was a marked liver enlargement, and multiple hypoattenuated areas were noted both with and without contrast medium (Figure 2); a diagnosis of metastatic liver disease was made. Transient elastography (Fibroscan®) was also performed and the observed value of 75 kPa (normal value < 8.0) was consistent with advanced liver fibrosis. Upper gastrointestinal tract endoscopy revealed esophageal varices (F1) and portal hypertensive gastropathy. To better define hepatic lesions, US-guided liver biopsy was obtained from both hypoattenuated areas and the surrounding parenchyma, and specimens routinely stained. At histology, main findings included a diffuse fibrosis surrounding regenerating nodules, intrasinusoidal collagen deposition, perivenular polymorphonuclear infiltration, focal fatty infiltration and ballooning degeneration with Mallory bodies, all features consistent with a final diagnosis of AAH on cirrhosis, with "pseudotumoral" areas. In the meantime, careful re-evaluation of usual daily alcohol intake, extended to patient's friends, allowed to estimate an actual daily intake of 250 g for many years.

Table 1 Biochemical characteristics of the patient

Parameters (reference value)	August 9, 2007	November 22, 2007	November 12, 2008
Haemoglobin (g/dL) (13-16)	12.7	12.2	12
MCV (fL) (84-94)	86	86	82
White blood count (× 10^3) (5.5-8.5)	9.7	8	5.3
Platelets count (× 10^3) (150-350)	119	102	184
PT (%)/INR (70-100/1.0-1.2)	54/1.3	90/1.2	94/1.1
PCR (mg/dL) (< 0.5)	1.8	0.6	0.4
Total/direct bilirubin (mg/dL) (1.1/0.8)	11.9/-	4.5/2.2	1.3/0.9
AST/ALT (IU/L) (< 35)	318/73	70/36	32/28
GGT (IU/L) (< 50)	1.309	150	46
Serum iron (mcg/dL) (70-170)	212	-	141
Transferrin (mg/dL) (200-400)	183	-	293
Ferritin (ng/mL) (400-220)	2.78	665	213

Patient's main laboratory test at enrolment (left column), 2 mo after complete alcohol withdrawal (central column) and at last control 1 year later (right column). MCV: Mean corpuscular value; PT: Prothrombin time; INR: International normalized ratio; CRP: C-reactive protein; AST: Aspartate aminotransferase; ALT: Alanine aminotransferase; GGT: γ-glutamyltransferase.

According to a Maddrey's discriminating factor of 63, we instituted a treatment consisting in the daily administration of 40 mg of prednisolone, rapidly followed by clinical and laboratory improvement. The regimen was slowly tapered down and at the following clinical observation in November 2007, the patient was asymptomatic, he had stopped drinking, his body weight had increased by 13 kg (from 55 to 68) and his physical examination revealed a dramatic reduction in liver size, with the lower hepatic edge at 5 cm below the right costal margin. Laboratory tests at that time are summarized in Table 1 (central column). Moreover, a new determination of the transient liver elastography indicated a value of 51 kPa, accounting for a decrease of 24 kPa as compared to the previous measurement. A further control, performed on November 11, 2008, showed the complete normalization of both physical findings and blood tests (Table 1, right column). Interestingly, at this time, the score at transient elastography was 8.5 kPa. As mean corpuscular volume of red blood cells was unusually "normal" (86 fL, with reference value of 84-94 fL) in the setting of AAH, and, also considering the ethnic origin of the patient, we investigated a possible underlying hemoglobinopathy by HPLC (high performance liquid chromatography), analysing different Hb fractions (Variant, Bio-Rad, Milan, Italy). Findings were consistent with a heterozygous state for HbE.

DISCUSSION

The present case report concerns a patient with AAH superimposed to established cirrhosis, with "pseudotumoral" hepatic areas. This unusual finding was first

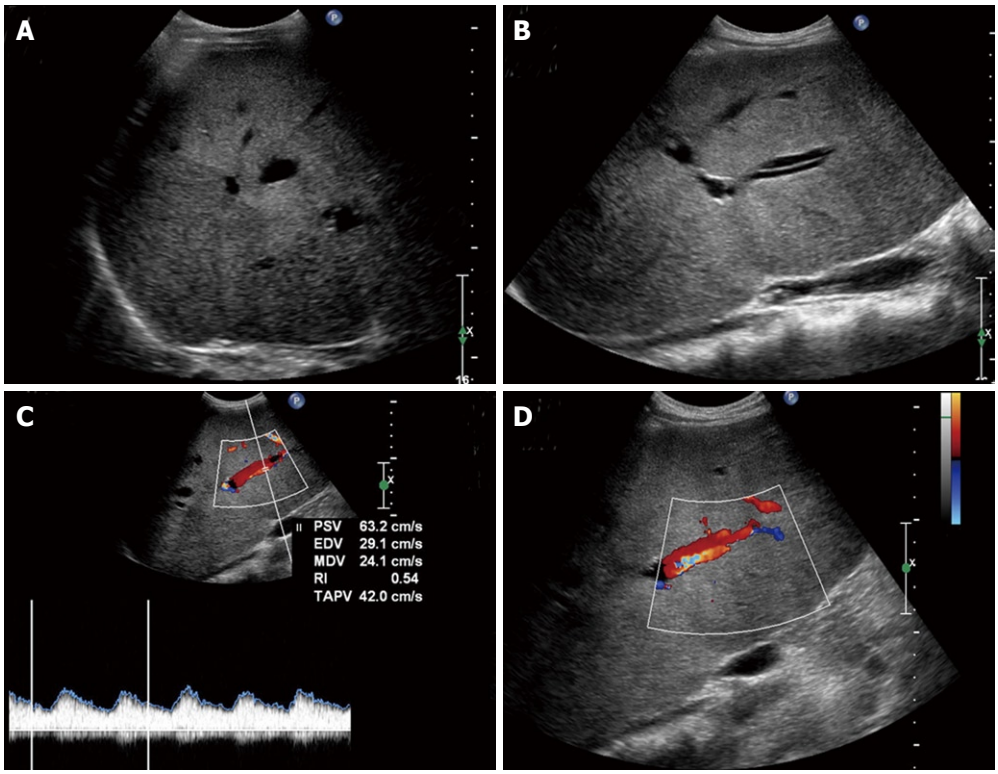

Figure 1 US scan showing a large hypoechoic area compared to surrounding parenchyma (A) and the image of "parallel channel" sign (B). Color-Doppler demonstrates the "pseudoparallel channel" sign, characterized by dilated intrahepatic arterial branch with an adjacent portal venous tract, and the low hepatic artery RI (C, D).

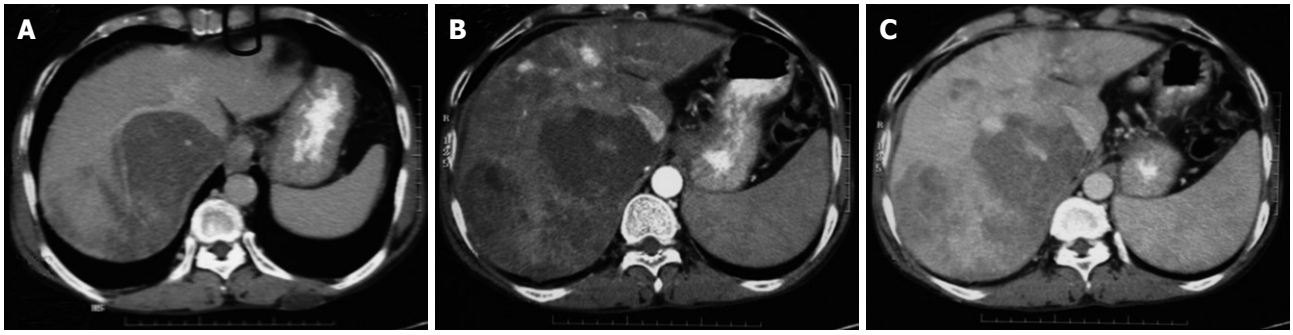

Figure 2 CT scan showing a wide hypovascularized area in the pre-contrast phase (A) that remains hypovascularized during both early (B) and late (C) arterial phases.

described in two reports[9,10], possibly involving the same single case. More recently, Colli *et al*[12] described both the CT and histological characteristics of "pseudotumoral" hepatic areas in five patients with AAH. These focal lesions were described as hypoattenuated areas when compared to the surrounding parenchyma, during the pre-contrast phase, becoming hyperattenuated during the post-contrast and late arterial phases, respectively, a pattern consistent with hypervascularized areas possibly related to a high-grade tissue regeneration. Interestingly, such lesions were closely similar to those observed in cases of large hepatocellular carcinoma[13], accounting for possible misdiagnosis. Differently from what previously reported, in this case the finding of many inhomogeneous, hypoattenuated areas highlighted during both pre- and post-contrast phases was more similar to metastatic cancer rather than to primary hepatocellular carcinoma and was responsible for the initial misdiagnosis of hepatic metastases. This led to further investigations, including a liver biopsy, which provided the correct diagnosis of AAH, ruling out any malignancy. This picture differs from the previously reported AAH CT pattern.

Occasionally, focal areas of normal parenchyma in an otherwise diffuse fatty liver may simulate mass lesions, described as "pseudolesions", that may pose a difficult diagnostic problem[14]. These areas usually present a vascularisation similar to the surrounding parenchyma: in the present case, instead, the lesions appeared clearly different in each vascular phase, as compared to the liver. Moreover, pseudo-tumoral hepatic lesions were described in a variety of other benign conditions, such as inflammatory pseudotumors, parasitic infestations, tuberculosis infection, or areas of focal sparing in diffuse processes[15-19], conditions ruled out in our patient.

An additional interesting finding, in the present case, was the presence of a typical alcohol-related duplex-Doppler image, called "pseudoparallel channel sign",

reported in patients with AAH by Sumino *et al*[7] and characterized by dilated intrahepatic arterial branch with an adjacent portal venous tract. A dilation of hepatic artery, with increased peak systolic velocity, has also been described by Han *et al*[9], who assumed that in AAH the presence of liver fibrosis increases sinusoidal resistance, blocking sinusoidal blood flow and ultimately portal blood flow in a retrograde manner. Therefore, in order to maintain hepatic perfusion, there is a dilation of hepatic artery leading to increased blood flow. A further interesting Doppler finding in this patient was the low hepatic artery RI, whose role in diagnosing AAH remains however controversial. Colli *et al*[8] reported a statistically significant decrease of hepatic artery RI in patients with AAH, as compared to both healthy and cirrhotic patients, a finding in contrast with the cirrhotic pattern observed in our patient. The possible relevance of the hepatic artery RI in AAH has also been challenged by Han *et al*[9], who reported a high variability of this sign in patients with liver disease, accounting for a lack of a clear-cut distinction between AAH and cirrhosis.

To assess the severity of underlying liver disease and to properly take care of the patient, we assessed three main prognostic models, all validated for AAH [i.e. Maddrey's discriminating factor (mDF), model for end-stage liver disease and Glasgow for acute alcohol hepatitis score (GAHS)][20-22]. Our case scored a total of 63, 14 and 9, respectively, compared to reference values of 32, 21 and 9. A mDF $\geqslant$ 32 and a GAHS score $\geqslant$ 9 identify patients with a very poor prognosis who have been reported to have had a good clinical response to corticosteroids[23]. Based on an mDF of 63 and a GAHS of 9, a corticosteroid regimen was instituted and then slowly progressive tapered down, on the basis of progressive clinical, laboratory and radiological improvement. At present, prognostic scores for AAH may orient the patient management, even if the use of steroids in this setting has recently been challenged by pertinent metanalytic data[24] while other treatments, such as anabolic steroids, pentoxifylline and infliximab, are still under investigation[25-27].

To complete the liver disease staging and to obtain data useful in the follow up, our patient underwent also a transient elastography (FibroScan®). Values obtained in this case were very high, indicating not only a possible advanced fibrosis of the liver, but also confirming recent reports suggesting that transient elastography can be influenced by other parameters, such as the degree of necroinflammatory activity, especially during acute hepatitis[28].

To summarize, in patients with AAH, "pseudotumoral" hepatic areas can appear at CT scan not only as hypervascular lesions similar to HCC, as previously described, but also as hypoattenuated lesions during all contrast phases, closely similar to liver metastases. This feature has to be carefully considered to avoid misdiagnosis.

ACKNOWLEDGMENTS

The Authors are greatly indebted to "Associazione Amici della Gastroenterologia del Granelli" for their continuing support.

REFERENCES

1 **Edmondson HA**, Peters RL, Frankel HH, Borowsky S. The early stage of liver injury in the alcoholic. *Medicine* (Baltimore) 1967; **46**: 119-129
2 **Cabré E**, Rodríguez-Iglesias P, Caballería J, Quer JC, Sánchez-Lombraña JL, Parés A, Papo M, Planas R, Gassull MA. Short- and long-term outcome of severe alcohol-induced hepatitis treated with steroids or enteral nutrition: a multicenter randomized trial. *Hepatology* 2000; **32**: 36-42
3 **Carithers RL Jr**, Herlong HF, Diehl AM, Shaw EW, Combes B, Fallon HJ, Maddrey WC. Methylprednisolone therapy in patients with severe alcoholic hepatitis. A randomized multicenter trial. *Ann Intern Med* 1989; **110**: 685-690
4 **Ramond MJ**, Poynard T, Rueff B, Mathurin P, Théodore C, Chaput JC, Benhamou JP. A randomized trial of prednisolone in patients with severe alcoholic hepatitis. *N Engl J Med* 1992; **326**: 507-512
5 **Mathurin P**, Duchatelle V, Ramond MJ, Degott C, Bedossa P, Erlinger S, Benhamou JP, Chaput JC, Rueff B, Poynard T. Survival and prognostic factors in patients with severe alcoholic hepatitis treated with prednisolone. *Gastroenterology* 1996; **110**: 1847-1853
6 **Okazaki H**, Ito K, Fujita T, Koike S, Takano K, Matsunaga N. Discrimination of alcoholic from virus-induced cirrhosis on MR imaging. *AJR Am J Roentgenol* 2000; **175**: 1677-1681
7 **Sumino Y**, Kravetz D, Kanel GC, McHutchison JG, Reynolds TB. Ultrasonographic diagnosis of acute alcoholic hepatitis 'pseudoparallel channel sign' of intrahepatic artery dilatation. *Gastroenterology* 1993; **105**: 1477-1482
8 **Colli A**, Cocciolo M, Mumoli N, Cattalini N, Fraquelli M, Conte D. Hepatic artery resistance in alcoholic liver disease. *Hepatology* 1998; **28**: 1182-1186
9 **Han SH**, Rice S, Cohen SM, Reynolds TB, Fong TL. Duplex Doppler ultrasound of the hepatic artery in patients with acute alcoholic hepatitis. *J Clin Gastroenterol* 2002; **34**: 573-577
10 **Sherlock S**, Dooley J. Alcohol and the liver. In: Diseases of the liver and biliary system. 9th ed. Oxford: Blackwell Scientific Publications, 1993: 370-389
11 **Nahon P**, Kettaneh A, Tengher-Barna I, Ziol M, de Lédinghen V, Douvin C, Marcellin P, Ganne-Carrié N, Trinchet JC, Beaugrand M. Assessment of liver fibrosis using transient elastography in patients with alcoholic liver disease. *J Hepatol* 2008; **49**: 1062-1068
12 **Colli A**, Massironi S, Faccioli P, Conte D. "Pseudotumoral" hepatic areas in acute alcoholic hepatitis: a computed tomography and histological study. *Am J Gastroenterol* 2005; **100**: 831-836
13 **Baron RL**, Oliver JH 3rd, Dodd GD 3rd, Nalesnik M, Holbert BL, Carr B. Hepatocellular carcinoma: evaluation with biphasic, contrast-enhanced, helical CT. *Radiology* 1996; **199**: 505-511
14 **Zezos P**, Tatsi P, Nakos A, Pachiadakis I, Kosmatopoulos F, Zafiriadou E, Molyvas E, Patsiaoura K. Focal fatty liver sparing lesion presenting as a "pseudotumour": case report. *Acta Gastroenterol Belg* 2006; **69**: 323-326
15 **Goldsmith PJ**, Loganathan A, Jacob M, Ahmad N, Toogood GJ, Lodge JP, Prasad KR. Inflammatory pseudotumours of the liver: A spectrum of presentation and management options. *Eur J Surg Oncol* 2009; [Epub ahead of print]
16 **Jin SA**, Jo DY, Lee HJ. An eosinophilic pseudotumour in the liver. *Br J Haematol* 2009; **146**: 232
17 **Benelbarhdadi I**, Benazzouz M, Ajana FZ, Ibrahimi A, Sassenou I, Afifi R, Belkhayat S, Essaid A, Sebti MF. [The

pseudo-tumoral form of hepatic tuberculosis. Five case reports] *Ann Gastroenterol Hepatol* (Paris) 1995; **31**: 277-280
18 **Kane PA**, Meili-Vergani G, Williams R, Karani JB. Pseudotumours of hepatic imaging. *Clin Radiol* 1996; **51**: 362-365
19 **Scriven MW**, Shandall A, Fitzgerald EJ, Puntis MC. Hepatic 'pseudotumours': an important diagnostic pitfall. *Ann R Coll Surg Engl* 1993; **75**: 43-45
20 **Maddrey WC**, Boitnott JK, Bedine MS, Weber FL Jr, Mezey E, White RI Jr. Corticosteroid therapy of alcoholic hepatitis. *Gastroenterology* 1978; **75**: 193-199
21 **Dunn W**, Jamil LH, Brown LS, Wiesner RH, Kim WR, Menon KV, Malinchoc M, Kamath PS, Shah V. MELD accurately predicts mortality in patients with alcoholic hepatitis. *Hepatology* 2005; **41**: 353-358
22 **Forrest EH**, Evans CD, Stewart S, Phillips M, Oo YH, McAvoy NC, Fisher NC, Singhal S, Brind A, Haydon G, O'Grady J, Day CP, Hayes PC, Murray LS, Morris AJ. Analysis of factors predictive of mortality in alcoholic hepatitis and derivation and validation of the Glasgow alcoholic hepatitis score. *Gut* 2005; **54**: 1174-1179
23 **Forrest EH**, Morris AJ, Stewart S, Phillips M, Oo YH, Fisher NC, Haydon G, O'Grady J, Day CP. The Glasgow alcoholic hepatitis score identifies patients who may benefit from corticosteroids. *Gut* 2007; **56**: 1743-1746
24 **Rambaldi A**, Saconato HH, Christensen E, Thorlund K, Wetterslev J, Gluud C. Systematic review: glucocorticosteroids for alcoholic hepatitis--a Cochrane Hepato-Biliary Group systematic review with meta-analyses and trial sequential analyses of randomized clinical trials. *Aliment Pharmacol Ther* 2008; **27**: 1167-1178
25 **Rambaldi A**, Iaquinto G, Gluud C. Anabolic-androgenic steroids for alcoholic liver disease: a Cochrane review. *Am J Gastroenterol* 2002; **97**: 1674-1681
26 **Akriviadis E**, Botla R, Briggs W, Han S, Reynolds T, Shakil O. Pentoxifylline improves short-term survival in severe acute alcoholic hepatitis: a double-blind, placebo-controlled trial. *Gastroenterology* 2000; **119**: 1637-1648
27 **Tilg H**, Jalan R, Kaser A, Davies NA, Offner FA, Hodges SJ, Ludwiczek O, Shawcross D, Zoller H, Alisa A, Mookerjee RP, Graziadei I, Datz C, Trauner M, Schuppan D, Obrist P, Vogel W, Williams R. Anti-tumor necrosis factor-alpha monoclonal antibody therapy in severe alcoholic hepatitis. *J Hepatol* 2003; **38**: 419-425
28 **Sagir A**, Erhardt A, Schmitt M, Häussinger D. Transient elastography is unreliable for detection of cirrhosis in patients with acute liver damage. *Hepatology* 2008; **47**: 592-595

S- Editor Tian L **L- Editor** Negro F **E- Editor** Zheng XM