

Alcohol-Associated Liver Disease

Chapter 353 | Part 10: Disorders of the Gastrointestinal System | Part 10 – Gastrointestinal Disorders | DETAILED EDITION

KEY CLINICAL POINTS

1. Alcohol-associated liver diseases (ALD) comprise a spectrum ranging from alcohol-associated fatty liver disease and steatohepatitis to fibrosis and cirrhosis.
2. Acute alcohol-associated hepatitis is an acute-on-chronic form of ALD associated with liver failure and high mortality.
3. Characteristic laboratory finding: AST/ALT ratio >1 , with serum AST rarely exceeding 300 IU/L.
4. Severe alcohol-associated hepatitis is defined by Maddrey discriminant function (MDF) ≥ 32 or MELD score >20 .
5. Glucocorticoid treatment (prednisolone 40 mg/d or methylprednisolone 32 mg/d IV) is indicated for severe AH without contraindications.
6. Contraindications for glucocorticoids include uncontrolled infections, sepsis, AKI, hepatorenal syndrome, uncontrolled GI bleeding, and specific comorbidities (viral hepatitis, HCC, pancreatitis, TB, HIV).
7. Liver transplantation is the leading indication for liver transplantation in the United States for alcohol-associated decompensated cirrhosis or HCC.
8. Fibrosis-4 (Fib-4) score <3.25 can be used to exclude advanced fibrosis or cirrhosis.
9. Transient elastography (FibroScan) cutoffs: <6 kPa normal, >8 kPa indicates $\geq F3$ advanced fibrosis, >12.5 kPa indicates F4 cirrhosis.
10. Genetic polymorphisms in PNPLA3, MBOAT7, and TM6SF2 are associated with increased risk of alcohol-associated liver cirrhosis.

FIGURES IN THIS CHAPTER

1. Alcohol-Associated 353 FIGURE 353-1 Treatment algorithm...

1. DEFINITION & OVERVIEW

- Alcohol-associated liver diseases (ALD) comprise a spectrum of diseases associated with chronic alcohol consumption ranging from alcohol-associated fatty liver disease and steatohepatitis to more advanced liver disease including fibrosis and cirrhosis.
- Acute alcohol-associated hepatitis is an acute-on-chronic form of ALD that is associated with liver failure and high mortality.

- *Harrison's defines this as:* Alcohol-associated liver diseases (ALD) comprise a spectrum of diseases associated with chronic alcohol consumption ranging from alcohol-associated fatty liver disease and steatohepatitis to more advanced liver disease including fibrosis and cirrhosis.
- A distinct subset of patients within ALD, termed as metabolic ALD (MetALD), now describes patients with metabolic dysfunction–associated steatotic liver disease (MASLD) and increased alcohol consumption.

1.1 Spectrum of Disease

- Simple hepatic steatosis
- Steatohepatitis
- Fibrosis
- Cirrhosis
- Acute alcohol-associated hepatitis (acute-on-chronic form)

2. EPIDEMIOLOGY

- Approximately 7% of adults in the United States meet criteria for unhealthy drinking, defined as ≥ 2 drinks per day in women and ≥ 3 drinks per day in men, or partake in heavy episodic drinking.
- Heavy episodic drinking is defined as ≥ 4 drinks for women and ≥ 5 drinks for men on a single occasion.
- 1 drink equals ~ 14 g of ethanol, which is 1 beer, 4 oz of wine, or 1 oz of 80% spirits.
- The COVID-19 pandemic increased excessive alcohol intake, resulting in a rise in morbidity and mortality linked to ALD.
- Prevalence of ALD correlates with the amount of alcohol consumption in different regions.
- Prevalence of alcohol-associated fatty liver disease is 4.7% of the general population in the United States.
- 1.5% has stage 2 or greater fibrosis.
- Liver cirrhosis is the eleventh leading cause of mortality worldwide, causing 1.16 million deaths annually.
- 48% of cases of cirrhosis can be attributed to alcohol.
- Among patients with alcohol misuse, 18% had fibrosis, 26% had cirrhosis, and 7% had acute alcohol-associated hepatitis without underlying cirrhosis.
- In the European population, the annual incidence rate for acute alcohol-associated hepatitis is between 24 and 27 per million persons in women and between 46 and 65 per million persons in men.

3. ETIOLOGY & PATHOPHYSIOLOGY

- Alcohol in the form of ethanol is rapidly absorbed in the upper gastrointestinal tract and predominantly metabolized in the liver.
- Ethanol reaches the liver through the portal vein, and the majority of ethanol is oxidized via alcohol dehydrogenase 1 (ADH1) into acetaldehyde in hepatocytes.
- Chronic alcohol consumption induces the expression of a second ethanol-metabolizing enzyme, cytochrome P450 family 2 subfamily E member 1 (CYP2E1), which also converts ethanol into acetaldehyde.
- In addition to the direct cellular toxic effects of acetaldehyde, metabolism of ethanol into acetaldehyde causes the generation of reactive oxygen species (ROS), resulting in further injury of hepatocytes via lipid peroxidation and DNA damage.
- Acetaldehyde is then oxidized into acetate via acetaldehyde dehydrogenase (ALDH).

- Inherited deficiency of ALDH2 is common in Asian countries and leads to acetaldehyde accumulation after alcohol consumption.
- These individuals develop nausea and cutaneous flushing.
- Acetate is converted into acetyl-coenzyme A (CoA), which contributes to fatty acid and triglyceride synthesis.
- Alcohol, in part through epigenetic changes, increases the expression of genes involved in lipogenesis, while genes involved in fatty acid transport and oxidation are suppressed.
- Alcohol also increases the ratio of reduced nicotinamide adenine dinucleotide (NAD)/oxidized NAD (NADH/NAD⁺) in hepatocytes, which further reduces mitochondrial β -oxidation.
- Alcohol can increase fatty acid mobilization in adipose tissue and the intestine, which will lead to hepatic accumulation of fatty acids and increased hepatic steatosis.
- Overall, the net effect of these processes contributes to accumulation of lipids in the liver.
- Ongoing fibrosis resulting from sustained alcohol consumption progresses to cirrhosis accompanied by portal hypertension.
- Impaired liver regeneration might contribute to the acute onset of alcohol-associated-hepatitis in patients with underlying cirrhosis.

3.1 Genetic Factors

- Twin studies demonstrated a genetic predisposition to alcohol-associated liver cirrhosis that is independent from the genetic predisposition to alcohol use disorder.
- Gene polymorphisms conferring increased risk of alcohol-associated liver cirrhosis have been found in three genes:
 - patatin-like phospholipase domain-containing 3 (PNPLA3)
 - membrane bound O-acyltransferase domain-containing 7 (MBOAT7)
 - transmembrane 6 superfamily member 2 (TM6SF2)
- Genetic variants in hydroxysteroid 17-beta dehydrogenase 13 (HSD17B13) and Fas-associated factor family member 2 (FAF2) are associated with a reduced risk of developing ALD.

3.2 Gut Microbiome

- A subset of patients with alcohol use disorder develop changes in the gut microbiome and increased intestinal permeability.
- This leads to the passage of microbial components, like bacterial lipopolysaccharide (LPS), through the portal vein into the liver resulting in hepatic inflammation, hepatocyte death, and activation of fibrotic pathways.

4. CLINICAL FEATURES

- The development of alcohol-associated steatosis, steatohepatitis, and cirrhosis is most often clinically silent.
- Symptoms arise once the patient with alcohol-associated liver cirrhosis decompensates or develops alcohol-associated hepatitis.
- Patients with alcohol-associated hepatitis have been drinking heavily (>40 g/d for women and >50–60 g/d for men) for >6 months with <60 days of abstinence before onset of symptoms.
- They present with rapid onset of jaundice (serum bilirubin >3 mg/dL), often accompanied by fever, malaise, tender hepatomegaly, and clinical signs of hepatic decompensation, such as ascites, bacterial infection, variceal bleeding, and hepatic encephalopathy.

- Alcohol-associated hepatitis is often accompanied by systemic inflammatory response syndrome (SIRS) and acute kidney injury (AKI) secondary to hepatorenal syndrome.
- Infections occur in 12–26% of patients with severe alcohol-associated hepatitis at the time of admission.

4.1 Symptoms and Signs

- Tiredness
- Malnutrition and sarcopenia
- Abdomen: abdominal discomfort, hepatomegaly, splenomegaly, caput medusae, ascites with weight gain, abdominal pain, and shortness of breath
- Skin: spider angioma, palmar erythema, jaundice, ecchymoses
- Eyes: icteric sclerae
- Hands: Dupuytren contracture
- Extremities: edema
- Face: rhinophyma
- Reproductive system: gynecomastia, gonadal atrophy, loss of libido, amenorrhea
- Neurologic:
 - Peripheral neuropathy
 - Alcohol withdrawal: tachycardia, agitation, tremor, seizures, delirium
 - Hepatic encephalopathy: asterixis (flapping tremor), forgetfulness, inversion of sleep/wake pattern, altered consciousness, confusion, lethargy, coma
- Wernicke-Korsakoff syndrome

5. DIFFERENTIAL DIAGNOSIS

- Diagnosis of ALD requires exclusion of other liver diseases in heavy drinkers.
- In the presence of potential confounding factors, including possible ischemic hepatitis (in the setting of, e.g., hypotension, massive gastrointestinal bleeding, recent cocaine use, septic shock), drug-induced liver injury (DILI), autoimmune liver disease, uncertain alcohol use assessment, or atypical laboratory tests (AST <50 IU/L or >400 IU/L, AST/ALT ratio <1.5), a transjugular liver biopsy is recommended to confirm the diagnosis of alcohol-associated hepatitis.
- Other chronic liver diseases such as viral hepatitis and hemochromatosis can have synergistic effects on ALD.

5.1 Confounding Factors

- Ischemic hepatitis
- Drug-induced liver injury (DILI)
- Autoimmune liver disease
- Uncertain alcohol use assessment
- Atypical laboratory tests (AST <50 IU/L or >400 IU/L, AST/ALT ratio <1.5)

6. INVESTIGATIONS & DIAGNOSIS

- Patients with simple hepatic steatosis can present with normal liver function tests.
- Steatohepatitis is characterized by elevated levels of aspartate aminotransferase (AST) and γ -glutamyl transferase (GGT).

- Characteristic laboratory parameters for ALD include a ratio of AST to alanine aminotransferase (ALT) of >1, and serum AST is rarely >300 IU/L.
- Serum bilirubin and international normalized ratio (INR) are typically normal in simple steatosis.
- Elevated bilirubin and INR and low serum albumin and platelet count are common laboratory findings in patients with cirrhosis.
- Patients with alcohol-associated hepatitis have AST and ALT elevations that do not exceed 400 IU/L, with AST/ALT ratio of >1.5 and serum bilirubin >3 mg/dL.
- The Alcohol Use Disorders Inventory Test (AUDIT) is a validated tool for identifying patients with alcohol use disorder.
- Alcohol-associated steatosis can be diagnosed by simple ultrasound, magnetic resonance imaging (MRI), or computed tomography (CT).
- Noninvasive quantification of hepatic fat can be achieved with the ultrasound technique of controlled attenuation parameter (CAP) or with magnetic resonance proton density fat fraction (MR-PDFF).
- Liver biopsy is rarely indicated for diagnosing alcohol-associated hepatic steatosis or steatohepatitis.
- Liver biopsy typically shows hepatocytes with large lipid droplets (macrovesicular steatosis) around pericentral veins (zone 3).
- Morphologic features of alcohol-associated steatohepatitis include hepatocyte injury and ballooning with Mallory-Denk bodies, necrosis, and lobular inflammation with mononuclear and neutrophilic granulocytes.
- Progression of alcohol-associated steatohepatitis to fibrosis can be diagnosed using liver stiffness measurement by techniques such as transient elastography (e.g., FibroScan).
- Liver stiffness <6 kPa indicates normal liver, whereas cutoffs for each stage of alcohol-associated liver fibrosis have been validated (>8 kPa indicates ≥F3 advanced fibrosis; >12.5 kPa indicates F4 cirrhosis).
- Fibrosis-4 (Fib-4) score is a serum marker test based on age, AST, ALT, and platelets and can be used to exclude advanced fibrosis or cirrhosis at a threshold value <3.25.
- Histology shows initially perivenular fibrosis with subsequent extension of collagen fibers into hepatic lobules, described as septal fibrosis.
- Patients with cirrhosis show liver nodularity on imaging with ultrasound, MRI, or CT scan.
- Radiologic signs of portal hypertension include ascites, splenomegaly, and portal-systemic collateral vessels.
- In patients presenting with features suggestive of alcohol-associated hepatitis, imaging is obtained to exclude biliary obstruction and hepatocellular carcinoma (HCC).
- In addition, other causes of liver disease such as viral hepatitis, Wilson's disease, and severe autoimmune liver disease should be ruled out.
- Infections need to be assessed routinely with chest x-ray and blood, urine, and ascites cultures in patients presenting with alcohol-associated hepatitis.

6.1 Diagnostic Scores and Cutoffs

- Maddrey discriminant function (MDF; calculated as $4.6 \times$ [the prolongation of the prothrombin time above control {seconds}] + serum bilirubin [mg/dL])
- Model for End-Stage Liver Disease (MELD; or sodium-MELD)
- Age-bilirubin-INR-creatinine (ABIC) score
- Fibrosis-4 (Fib-4) score <3.25 excludes advanced fibrosis or cirrhosis
- Transient elastography (FibroScan): <6 kPa normal, >8 kPa ≥F3, >12.5 kPa F4

7. MANAGEMENT & TREATMENT

- To date, the most effective therapy to reduce the progression of and reverse ALD is prolonged alcohol abstinence.
- In particular, alcohol-associated hepatic steatosis and steatohepatitis are reversible with cessation of alcohol consumption.
- Thus, treatment of the underlying alcohol use disorder is an integral part for therapy of ALD.
- There are currently no approved drugs for treatment of alcohol-associated steatosis and steatohepatitis with or without fibrosis.
- Patients with alcohol-associated cirrhosis and ongoing alcohol consumption are at risk for decompensation and development of hepatic encephalopathy, ascites, variceal bleeding, hepatorenal syndrome, and HCC.
- Patients with cirrhosis should undergo an upper gastrointestinal endoscopy to screen for varices.
- HCC screening is recommended using liver ultrasonography and serum α -fetoprotein (AFP) every 6 months in patients with cirrhosis.
- Management of complications of cirrhosis such as variceal bleeding, ascites, hepatic encephalopathy, and HCC does not differ from patients with cirrhosis due to a different etiology.
- Liver transplantation for patients with alcohol-associated decompensated cirrhosis or HCC is a definitive therapy and is currently the leading indication for liver transplantation in the United States.
- Liver transplantation evaluation should be taken into consideration for patients with end-stage liver disease.
- In patients diagnosed with alcohol-associated hepatitis, short-term mortality can be predicted using the Maddrey discriminant function (MDF), MELD score, or ABIC score.
- Patients with $MDF < 32$ or $MELD \leq 20$ are defined as having moderate alcohol-associated hepatitis.
- Patients with $MDF \geq 32$ or $MELD > 20$ identifies patients with severe alcohol-associated hepatitis and high short-term mortality of ~30% at 3 months, who will have a survival benefit with glucocorticoid treatment.
- Contraindications for glucocorticoid treatment include uncontrolled infections or sepsis, AKI and hepatorenal syndrome, uncontrolled upper gastrointestinal bleeding, concomitant diseases (including viral hepatitis, HCC, pancreatitis, DILI, active tuberculosis, and HIV), multiorgan failure, and shock.
- Glucocorticoids can be used once infection, sepsis, and gastrointestinal bleeding are adequately controlled.
- Patients with moderate alcohol-associated hepatitis have a 20% risk of 1-year mortality.
- Patients with severe alcohol-associated hepatitis have high short-term mortality of ~30% at 3 months.
- Treatment of moderate alcohol-associated hepatitis:
 - Multidisciplinary team including an alcohol use disorder specialist, dietitian for nutritional supplementation for patients with markedly reduced intake, and hepatologist for managing liver disease complications.
 - Enteral nutrition with a goal of 35–40 kcal/kg and supplementation of micronutrients (in particular zinc) and vitamin supplementation (in particular vitamin B and K) are recommended for patients with alcohol-associated hepatitis.
 - Intravenous albumin is preferred for volume expansion.
- Treatment of severe alcohol-associated hepatitis:
 - Oral prednisolone 40 mg/d
 - Methylprednisolone 32 mg/d IV (unable to take oral medications)
 - Duration: 28 days total
 - Monitoring: Lille score < 0.45 (responders), Lille score ≥ 0.45 (non-responders)
 - If eligible, early liver transplantation (LT)

- If not eligible for LT: Supportive/palliative care
- Nonresponders or patients with contraindications for treatment should be considered for early liver transplantation (LT) or supportive or palliative care, as clinically appropriate.

7.1 Pharmacologic Therapy

- Drug: Prednisolone
- Dose: 40 mg/d
- Route: Oral
- Duration: 28 days total
- Monitoring: Lille score
- Contraindications: Infection, sepsis, AKI, HRS, uncontrolled bleeding, concomitant diseases (viral hepatitis, HCC, pancreatitis, DILI, TB, HIV), multiorgan failure, shock
- Drug: Methylprednisolone
- Dose: 32 mg/d
- Route: IV
- Indication: Unable to take oral medications
- Duration: 28 days total
- Monitoring: Lille score
- Contraindications: Same as Prednisolone

7.2 Nutritional Support

- Enteral nutrition with a goal of 35–40 kcal/kg
- Supplementation of micronutrients (in particular zinc)
- Vitamin supplementation (in particular vitamin B and K)

8. PROGNOSIS & COMPLICATIONS

- Patients with alcohol-associated cirrhosis and ongoing alcohol consumption are at risk for decompensation and development of hepatic encephalopathy, ascites, variceal bleeding, hepatorenal syndrome, and HCC.
- Patients with cirrhosis should undergo an upper gastrointestinal endoscopy to screen for varices.
- HCC screening is recommended using liver ultrasonography and serum α -fetoprotein (AFP) every 6 months in patients with cirrhosis.
- Management of complications of cirrhosis such as variceal bleeding, ascites, hepatic encephalopathy, and HCC does not differ from patients with cirrhosis due to a different etiology.
- Liver transplantation for patients with alcohol-associated decompensated cirrhosis or HCC is a definitive therapy and is currently the leading indication for liver transplantation in the United States.
- Liver transplantation evaluation should be taken into consideration for patients with end-stage liver disease.
- Patients with moderate alcohol-associated hepatitis have a 20% risk of 1-year mortality.
- Patients with severe alcohol-associated hepatitis have high short-term mortality of ~30% at 3 months.
- Short-term mortality can be predicted using the Maddrey discriminant function (MDF), MELD score, or ABIC score.

8.1 Mortality Predictors

- Maddrey discriminant function (MDF)

- Model for End-Stage Liver Disease (MELD)
- Age-bilirubin-INR-creatinine (ABIC) score

9. SPECIAL CONSIDERATIONS

- In the presence of potential confounding factors, including possible ischemic hepatitis (in the setting of, e.g., hypotension, massive gastrointestinal bleeding, recent cocaine use, septic shock), drug-induced liver injury (DILI), autoimmune liver disease, uncertain alcohol use assessment, or atypical laboratory tests (AST <50 IU/L or >400 IU/L, AST/ALT ratio <1.5), a transjugular liver biopsy is recommended to confirm the diagnosis of alcohol-associated hepatitis.
- Infections need to be assessed routinely with chest x-ray and blood, urine, and ascites cultures in patients presenting with alcohol-associated hepatitis.

9.1 Confounding Factors

- Ischemic hepatitis
- Drug-induced liver injury (DILI)
- Autoimmune liver disease
- Uncertain alcohol use assessment
- Atypical laboratory tests (AST <50 IU/L or >400 IU/L, AST/ALT ratio <1.5)

10. KEY PEARLS & CLINICAL TRAPS

- Only 10–20% of individuals with daily alcohol consumption or heavy drinking will develop progressive liver disease and cirrhosis.
- Women develop ALD at a lower daily alcohol intake.
- Cigarette smoking is an independent risk factor for alcohol-associated cirrhosis.
- The drinking pattern, in particular binge drinking and excessive alcohol drinking outside meals, increases the risk of developing progressive ALD.
- Obesity and metabolic dysfunction–associated steatotic liver disease (MASLD) are frequent cofactors contributing to progression of ALD.
- A distinct subset of patients within ALD, termed as metabolic ALD (MetALD), now describes patients with MASLD and increased alcohol consumption.

11. WHAT TO LOOK FOR — DIAGNOSTIC CLUES

- Morphologic features of alcohol-associated steatohepatitis include hepatocyte injury and ballooning with Mallory-Denk bodies, necrosis, and lobular inflammation with mononuclear and neutrophilic granulocytes.
- Liver stiffness >8 kPa indicates ≥F3 advanced fibrosis; >12.5 kPa indicates F4 cirrhosis.
- Fib-4 score <3.25 excludes advanced fibrosis or cirrhosis.
- Characteristic laboratory parameters for ALD include a ratio of AST to ALT of >1, and serum AST is rarely >300 IU/L.
- Patients with alcohol-associated hepatitis have AST and ALT elevations that do not exceed 400 IU/L, with AST/ALT ratio of >1.5 and serum bilirubin >3 mg/dL.
- Rapid onset of jaundice (serum bilirubin >3 mg/dL), often accompanied by fever, malaise, tender hepatomegaly, and clinical signs of hepatic decompensation.
- Infections occur in 12–26% of patients with severe alcohol-associated hepatitis at the time of admission.

12. WHAT EXCLUDES THE DIAGNOSIS

- Diagnosis of ALD requires exclusion of other liver diseases in heavy drinkers.
- In the presence of potential confounding factors, including possible ischemic hepatitis (in the setting of, e.g., hypotension, massive gastrointestinal bleeding, recent cocaine use, septic shock), drug-induced liver injury (DILI), autoimmune liver disease, uncertain alcohol use assessment, or atypical laboratory tests (AST <50 IU/L or >400 IU/L, AST/ALT ratio <1.5), a transjugular liver biopsy is recommended to confirm the diagnosis of alcohol-associated hepatitis.
- Other chronic liver diseases such as viral hepatitis and hemochromatosis can have synergistic effects on ALD.
- Contraindications for glucocorticoid treatment include uncontrolled infections or sepsis, AKI and hepatorenal syndrome, uncontrolled upper gastrointestinal bleeding, concomitant diseases (including viral hepatitis, HCC, pancreatitis, DILI, active tuberculosis, and HIV), multiorgan failure, and shock.
- Glucocorticoids can be used once infection, sepsis, and gastrointestinal bleeding are adequately controlled.

FLOWCHARTS & ALGORITHMS — FROM HARRISON'S

ultrasound technique of controlled attenuation parameter (CAP) or with magnetic resonance proton density fat fraction (MR-PDFF). Liver biopsy is rarely indicated for diagnosing alcohol-associated hepatic steatosis or steatohepatitis. Liver biopsy typically shows hepatocytes with large lipid droplets (macrovesicular steatosis) around pericentral veins (zone 3). Morphologic features of alcohol-associated steatohepatitis include hepatocyte injury and ballooning with Mallory-Denk bodies, necrosis, and lobular inflammation with mononuclear and neutrophilic granulocytes.

Progression of alcohol-associated steatohepatitis to fibrosis can be diagnosed using liver stiffness measurement by techniques such as transient elastography (e.g., FibroScan). Liver stiffness <6 kPa indicates normal liver, whereas cutoffs for each stage of alcohol-associated liver fibrosis have been validated (>8 kPa indicates ≥F3 advanced fibrosis; >12.5 kPa indicates F4 cirrhosis). Fibrosis-4 (Fib-4) score is a serum marker test based on age, AST, ALT, and platelets and can be used to exclude advanced fibrosis or cirrhosis at a threshold value <3.25. Histology shows initially perivenular fibrosis with subsequent extension of collagen fibers into hepatic lobules, described as septal fibrosis. Patients with cirrhosis show liver nodularity on imaging with ultrasound, MRI, or CT scan. Radiologic signs of portal hypertension include ascites, splenomegaly, and portal-systemic collateral vessels. Prognosis and risk of mortality are assessed using Child-Pugh-Turcotte (CPT) or Model for End-Stage Liver Disease (MELD; or sodium-MELD) scores (Chap. 355).

In patients presenting with features suggestive of alcohol-associated hepatitis, imaging is obtained to exclude biliary obstruction and hepatocellular carcinoma (HCC). In addition, other causes of liver disease such as viral hepatitis, Wilson's disease, and severe autoimmune liver disease should be ruled out. Histology shows macrovesicular steatosis, hepatocyte ballooning with Mallory-Denk bodies, megamitochondria, neutrophil infiltration, ductular reaction, bilirubinostasis, and chicken wire fibrosis. The majority of patients with alcohol-associated hepatitis have underlying cirrhosis (80%) (Chap. 355), and 10–20% of patients with a clinical diagnosis of alcohol-associated hepatitis will have other liver diseases on biopsy. Therefore, in the presence of potential confounding factors, including possible ischemic hepatitis (in the setting

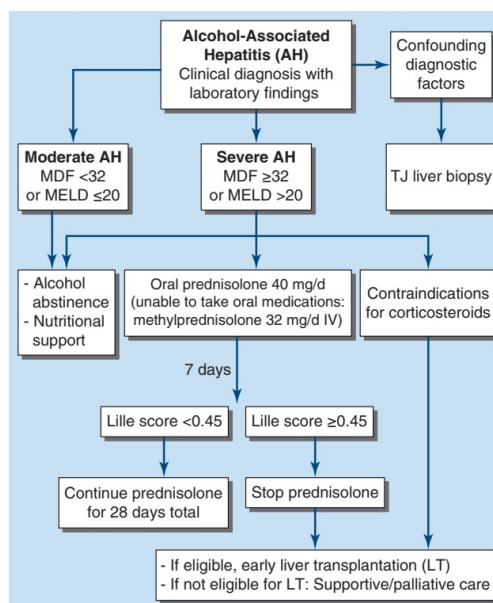


FIGURE 353-1 Treatment algorithm for alcohol-associated hepatitis. In patients with a clinical diagnosis of alcohol-associated hepatitis, confounding factors (see text) need to be ruled out, if necessary, by transjugular (TJ) liver biopsy. Patients with severe alcohol-associated hepatitis (AH), defined as Maddrey discriminant function (MDF) ≥ 32 or Model for End-Stage Liver Disease (MELD) score > 20 , without contraindications for glucocorticoids (see text) are candidates for such treatment. Nonresponders or patients with contraindications for treatment should be considered for early liver transplantation (LT) or supportive or palliative care, as clinically appropriate.

Harrison's 22e · Flowchart 1

Alcohol-Associated 353 **FIGURE 353-1** Treatment algorithm for alcohol-associated hepatitis. In patients with a clinical diagnosis of alcohol-associated hepatitis, confounding factors (see text) need to be ruled out, if necessary, by transjugular (TJ) liver biopsy. Patients with severe alcohol-associated hepatitis (AH), defined as Maddrey discriminant function (MDF) ≥ 32 or Model for End-Stage Liver Disease (MELD) score > 20 , without contraindications for glucocorticoids (see text) are candidates for such treatment. Nonresponders or patients with contraindications for treatment should be considered for early liver transplantation (LT) or supportive or palliative care, as clinically appropriate.