

Non-Intensive Care Unit Management of Acute Liver Failure

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KEYWORDS

• Acute liver failure • Treatment • Emergency department • Hospital ward

KEY POINTS

- Acute liver failure (ALF) is relatively uncommon with a variable and unpredictable course.
- Prompt recognition and initiation of supportive care as well as cause-specific interventions when possible may improve outcomes in ALF.
- Although many patients may benefit or require admission to an intensive care unit (ICU) (ideally one with expertise in management of ALF and at a liver transplant center), non-ICU management should focus on monitoring for progression of ALF as well as early identification and management of complications.

Acute liver failure (ALF) is a relatively uncommon clinical syndrome characterized by rapid and severe hepatic dysfunction associated with high morbidity and mortality.¹ Widespread implementation of interventions such as the use of N-acetylcysteine (NAC) for acetaminophen-induced ALF, improvements in emergency medical and critical care medicine, as well as increased availability of liver transplantation have markedly increased survival of individuals with this condition over the past few decades.² Management of patients with ALF typically involves multiple specialists and different levels of care, including outpatient clinics, urgent care facilities, emergency departments, general inpatient wards, intensive care units (ICU), and operating rooms if liver transplantation is performed. This review focuses on medical care of patients with ALF in non-ICU settings and will not address issues related to ICU management of ALF and its complications, liver transplantation, or liver-assist devices.

Using a standardized definition for ALF is crucial to improve communication across different levels of care within the same or across different health care systems. Results

The authors have nothing to disclose.

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from a systematic review demonstrate significant heterogeneity in definitions used in the literature and even absence of a specific definition in many publications.³ Current guidelines recommend defining ALF as an acute insult resulting in severe hepatic dysfunction characterized by evidence of coagulopathy (international normalized ratio [INR] ≥ 1.5) and any degree of alteration of mental status in the absence of preexisting cirrhosis and with an illness of less than 26 weeks' duration.⁴ Individuals with Wilson disease, vertically transmitted hepatitis B virus (HBV) infection, or autoimmune hepatitis (AIH) may be included in this definition despite having cirrhosis if their disease has only been recognized for less than 26 weeks.^{4,5} The American Association for the Study of Liver Disease guidelines discourage the use of terms such as fulminant hepatic failure or stratifying the duration of illness (ie, subacute, acute, hyperacute), because these may create confusion without adding significant prognostic value.⁴ Elevation of serum aminotransferases and bilirubin commonly occurs to varying extent in ALF, but these biochemical abnormalities are not included in its definition. The term acute liver injury should be used for cases in which coagulopathy is present but there is no alteration of mental status, and acute-on-chronic liver failure should be used to describe an acute deterioration of hepatic function in individuals with underlying chronic liver disease (Table 1).⁶

CAUSES OF ACUTE LIVER FAILURE

It is important to review the commonest causes of ALF in order to understand some basic principles of management of this condition. There are significant differences in the epidemiology of ALF in various countries and regions of the world. For instance, drug-induced liver injury (DILI) is the commonest cause of ALF in the United States, Western Europe, and Australia. In contrast, viral infections (hepatitis A, B, and E) remain important causes in Asia, Eastern Europe, and most developing countries.^{7,8} Identifying the cause of ALF provides important prognostic information and is critical for timely implementation of therapeutic interventions that may alter its natural course.⁹ However, a specific cause of ALF may not be identified in a large proportion of individuals (6%–38%) despite extensive workup.⁷ The commonest causes of ALF are summarized in Table 2.

- Acetaminophen hepatotoxicity: patients with suspect or established acetaminophen-induced hepatotoxicity usually undergo initial evaluation and management in non-ICU settings such as urgent care facilities or emergency departments. Freestanding urgent care facilities should immediately contact the nearest hospital and initiate the transfer process, because the level of care needed exceeds that available in these facilities. Data from observational studies estimate that acetaminophen overdose is responsible for up to 78,414 emergency department visits and approximately 33,520 hospitalizations annually in the United States.¹⁰ The overwhelming majority of cases of

Table 1
Clinical characteristics of 3 different acute hepatic syndromes

Clinical Syndrome	Coagulopathy	Encephalopathy	Underlying Chronic Liver Disease
Acute liver injury	+	–	+/–
ALF	+	+	–
Acute-on-chronic liver failure	+	+	+

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