Acute Liver Failure
An Update

James E. Squires, MD, MS*, Patrick McKiernan, MD,
Robert H. Squires, MD

KEYWORDS

• Acute liver failure • Children • Acute liver failure management • Encephalopathy
• Diagnosis of acute liver failure

KEY POINTS

- Pediatric acute liver failure is a dynamic, life-threatening condition of disparate etiology.
- Management is dependent on intensive collaborative clinical care and support.
- Proper recognition and treatment of common complications of liver failure are critical to optimizing outcomes.
- Identifying underlying cause and implementing timely, appropriate treatment can be life-saving.

INTRODUCTION

Acute liver failure (ALF) is a dynamic clinical condition manifested by an abrupt onset of a liver-based coagulopathy and biochemical evidence of hepatocellular injury resulting from rapid deterioration in liver cell function. The Pediatric Acute Liver Failure (PALF) Study, funded by the National Institutes of Health and the National Institutes of Diabetes and Digestive and Kidney Diseases, identified clinical and biochemical study entry criteria (**Box 1**).

These criteria were not intended to define PALF, but rather to identify subjects with acute liver injury sufficiently severe to place the child at risk for progressive clinical deterioration that could result in liver transplantation or death. Beyond the PALF study, children meeting PALF study entry criteria should prompt referral, or at least contact with, a pediatric liver transplant center, as early referral is known to improve outcome.

The ALF phenotype can be precipitated by disparate etiologies that include drug-induced, metabolic and genetic, infectious, immune-mediated, hemodynamic, and oncologic injuries; however, a definitive diagnosis is not determined in up to 50% of

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Department of Pediatric Gastroenterology and Hepatology, University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh, 4401 Penn Avenue, Pittsburgh, PA 15224, USA
* Corresponding author.
E-mail address: james.squires2@chp.edu

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Box 1
Pediatric Acute Liver Failure (PALF) study entry criteria

- No known evidence of chronic liver disease
- International Normalized Ratio (INR), following parenteral administration of vitamin K, $\geq$1.5 with clinical hepatic encephalopathy (HE)
- INR is $\geq$2.0 with or without HE

Data from Squires RH Jr, Shneider BL, Bucuvalas J, et al. Acute liver failure in children: the first 348 patients in the pediatric acute liver failure study group. J Pediatr 2006;148(5):652–8.

cases. Proper management is dependent on intensive collaborative clinical care and support and, for a handful of conditions, specific therapy that can be life-saving. Outcomes in the pre–liver transplant era were limited to survival or death. Liver transplantation (LTx) interrupts the natural history of ALF and, consequently, this third outcome is most certainly composed of individuals who would have lived or would have died in the absence of LTx. Predicting patient outcome in the LTx era has been unfulfilling and better predictive models must be developed for proper stewardship of the limited resource of organ availability.

GENERAL MANAGEMENT AND COMPLICATIONS

General

Once a patient meets PALF study entry criteria, general management strategies should be undertaken regardless of etiology. Early transfer to a pediatric liver transplant center before development of clinical encephalopathy is associated with improved outcomes.[1] A general algorithm for patients meeting PALF study entry criteria is presented in **Fig. 1**.

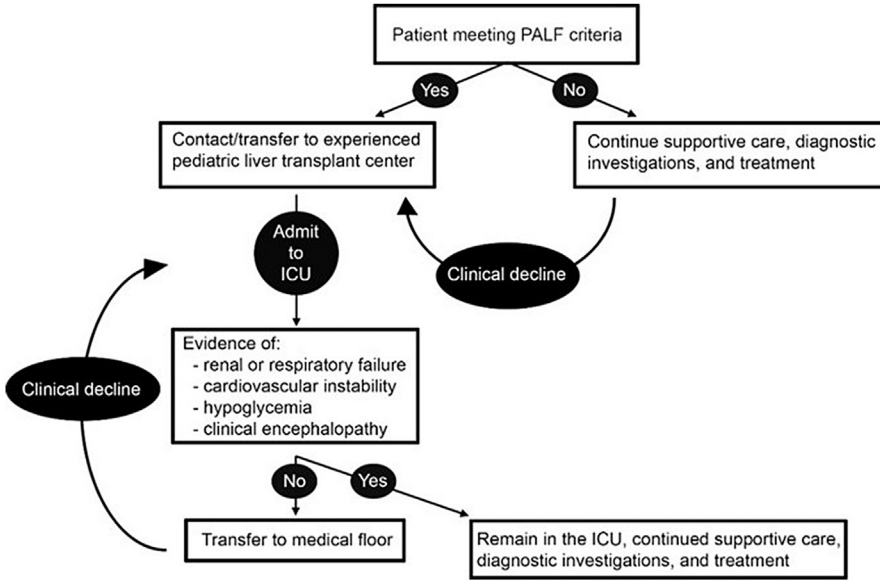

Fig. 1. A general algorithm for patients who meet the entry criteria for the PALF study. ICU, intensive care unit.