Chapter 7

The liver in critical illness

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Introduction

The liver is in some ways the forgotten organ in intensive care practice. Very many more laboratory and clinical studies have investigated the role, function, and support of the lung, heart, brain, and kidney in critical illness than have studied the liver. Nevertheless, in the time of the Greek scholars, there was already acknowledgement of the role of the liver in non-hepatic diseases such as systemic sepsis, and an understanding that such involvement confers a poorer prognosis – hence the inclusion of the wisdom of Hippocrates in this compilation of classic papers. In the review article by Matuschak and Rinaldo, the reasons why liver dysfunction is associated with a poorer outcome in critical illness are explored, and the concept of the liver being a ‘driving force’ in multiple organ dysfunction is developed. In addition, jaundice without significant liver dysfunction is associated with left ventricular dysfunction, at least in the dog model developed by Professor Otto Better and his colleagues in Israel. This observation is relevant to the progressive resistance to inotropic and vasopressor agents in jaundiced critically ill patients.

One of the most devastating insults that can occur in critical illness is acute liver ischemia, resulting in the clinical syndrome of ischemic or hypoxic hepatitis. Although relatively common, this syndrome has been difficult to study prospectively. Consequently, the paper by Jean Henrion from Belgium offers new insights into the hemodynamic associations of ischemic hepatitis, which is, of course, a circulatory disease, not a liver disease.

Commonly used ‘liver function tests’ assess damage to the liver rather than its function. An understanding of the complex relationship between critical illness and liver dysfunction has been hampered by the absence of a simple test that assesses at least one of the many functions of the liver. The MEGX test, developed by Oellerich and co-workers in Germany, allows dynamic assessment of liver function, and may prove useful in the evaluation of therapies to support liver function in critical illness.

The complex issues involved in the management of patients with acute liver failure exemplify the many important functions of the healthy liver. With the advent of liver transplantation as the principle treatment for patients with fulminant hepatic failure, these patients are almost always managed in ICUs servicing liver transplant units. Consequently, it is extremely important that intensive care practitioners in non-liver units understand the need to refer patients to transplant units, as well as the role of transplantation in acute liver failure and its indications. The seminal paper by O’Grady and the group from King’s College Hospital, London, develops criteria for liver transplantation in acute liver failure. That a successful outcome is possible after emergency liver transplantation for acute liver failure is shown in the early series of cases reported from the French group from Clichy and Villejuif. When transplantation is not indicated, or while awaiting a donor, the principal treatment is supportive. The paper by Harrison and co-workers, again from the King’s Liver Unit, investigates the effects of n-acetylcysteine in patients with acute liver failure, and the findings of this study have resulted in widespread use of this agent in this setting. Currently, there is still no safe, effective means of artificial liver support for patients awaiting transplantation or liver regeneration. The case report from Saunders and co-workers from Cape Town, South Africa, describes an early attempt to develop such support.

Finally, patients with cirrhosis and other forms of chronic liver disease present different management challenges for the intensive care specialist. The randomized controlled trial from
the Barcelona group shows that in patients with spontaneous bacterial peritonitis and cirrhosis, the outcome is improved by infusing albumin in addition to antibiotic therapy.

There are many classic papers that have not been included in this small selection. The majority of papers have been chosen for the underlying ideas and variety rather than for scientific rigor. They are aimed at clinical intensive care specialists with enquiring minds who work in general intensive care units, rather than experts in liver units or intensive care units servicing liver transplant units. I have found the liver a fascinating organ to study. I trust this selection of papers will likewise stimulate your interest.