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Liver Intensive Care



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Are survival rates for acute liver failure (ALF) still improving? What can that be attributed to?

Yes, the outcome for ALF continues to improve, and this is seen both in those managed medically and in those who require transplantation. The reasons for this are multiple and depend largely on small incremental improvements, critical care management for the medically treated and surgical and anaesthesia management in addition to critical care for those proceeding to transplantation.

Acute liver failure has a relatively high mortality rate - what are the main challenges in improving survival and what should research focus on?

The mortality rate for ALF is indeed high, but within this group outcome is also dependent greatly upon disease aetiology and co-morbid factors. Patients presenting with an indolent subacute course have, ironically, a greatly higher mortality without transplantation than those with a rapidly progressive deterioration and much more severe organ failure (Bernal et al. 2013). From this we should, I believe, concentrate upon the drivers and determinants of effective liver regeneration and stabilisation of immune function. These co-factors are inherently linked with sepsis and inflammation, frequently appearing to inhibit or indeed prevent effective regenerative capacity.

What has been the most promising advance in prognosis of ALF patients?

Again I would say small incremental improvements in critical care – ensuring that the many studies that have come out of critical care over the last years are applied appropriately to sub-specialities alongside other focused management; and that care is consistent and delivered by a cohesive, motivated and enthusiastic multidisciplinary team. Specifics are difficult, but decreased infection through improved standards, less sedation after the risk of raised intracranial pressure has passed, recognition of the role of earlier renal replacement therapy (RRT) to facilitate ammonia clearance and metabolic stability (sodium, temperature), Hb triggers, appropriate fluids and vasoactive agents - these changes (all added together) over many years have impacted on improvements in so many critical care specialities. Perhaps in the future the hope will be greater understanding of systemic and regional immune function and manipulation of said factors to promote organ healing/regeneration.

In terms of disease patterns, what are the major challenges for a liver intensive care unit - non-alcoholic fatty liver disease (with rising obesity), liver failure due to alcoholism, or other diseases/syndromes?

Really all the above; we are seeing steady numbers of patients with acute liver failure (ALF), but those with Acute-on-Chronic Liver Failure (AoCLF) (Moreau et al. 2013) are also a rapidly-growing group, alongside a large number of patients going forward for extensive liver surgery for cancer resection, often with a background of abnormal liver function (fibrosis and fatty liver). A subgroup of patients with acute alcoholic hepatitis is also sadly a growing problem, the patients often very young, but with severe disease and risk of rapidly progressive multiple organ failure. The challenges, for this group especially, are therapy to dampen hepatic inflammation, promotion of regeneration and limitation of the effects of systemic inflammation/ sepsis on both hepatic and extra hepatic organ function.

The Liver Intensive Care Unit (LITU) at Kings College hospital in London is unique to the UK. What does it take to set up and run such a unit? What are the benefits of a centre of expertise such as this?

The LITU was the brainchild of my previous boss, Professor Roger Williams, and started life as a two-bed area off a corridor back in the early 1970s. It is now a 19-bed critical care service with facilities appropriate to manage patients with multiple organ failure; the changes have perhaps

mirrored those of critical care growth and development over these decades. Perhaps what this service has allowed to develop is a concept of specialist critical care under an umbrella of critical care with strong links to the base speciality in addition. This has allowed for teaching and training, research and clinical care to be delivered, developing learning from hepatology and liver surgery whilst maintaining a strong and cohesive remit of critical care as the base speciality that underpins high quality care for patients with liver and other organ failures.

This interview will appear in ICU Management's Spring issue with a cover story on "The Lung." What are the main challenges in treating lung complications of liver disease?

Lung complications are a frequent issue in patients with liver disease (Machicao et al. 2014), and perhaps the most common, and potentially avoidable, is the high incidence of overt and covert micro-aspiration in patients with encephalopathy in a ward environment, and particularly so in those undergoing upper GI endoscopic procedures without airway control. Specific liver lung complications are the development of hydrothoraces (important as just as one can see spontaneous bacterial peritonitis in the ascites, similar infection may also be seen in the pleural fluid), atelectasis and diaphragmatic splinting with resultant V/Q match. Hepatopulmonary syndrome (shunting through parenchymal arterio-venous shunts) should always be considered and may be diagnosed by considering the diagnosis, dyspnoea, platypnoea and orthodeoxia – all worse in the upright position. Confirmatory diagnosis would normally now be with contrast echocardiography. The links between hepatopulmonary syndrome and portopulmonary are fascinating, with the latter being the presence of portal and pulmonary hypertension. Following the finding of elevated right-sided pressures further investigations need to be undertaken to separate pulmonary venous or arterial hypertension and assess reversibility.

Are there liver patients that should not be admitted to the ICU e.g. cirrhotic patients, patients with hepatorenal syndrome? What is the basis for these difficult decisions?

This is always complex, and for me one of the issues is that outcomes are steadily improving for these patients over time, and thus the application of any scoring system on admission may result in limited options for an individual (Levesque et al. 2012). On a personal note I would prefer to offer admission and assess response to therapy over the next few days; having had an open and clear discussion with the patient, if possible, and certainly the patient's family. Recent scoring systems that have been examined are SOFA and Royal Free Score (McPhail et al. 2014; Theodoridou et al. 2014). The CLIF-SOFA score has also been shown to be a useful predictive score, and although initially derived from predominantly ward patients has applicability to critical care also (Jalan et al. 2014). It should always be remembered that for all of these scores – they are statistical models and apply to large groups as opposed to having the sensitivity and specificity for individual decision-making. Hepatorenal failure is something that is always associated with poor outcome; it should be recognised, however, that this is a diagnosis of exclusion and most patients are actually presenting with a hypovolaemic or septic acute kidney injury (Fagundes et al. 2013); the outcome for this being considerably better than that seen for true hepatorenal failure in association with end-stage cirrhosis. In this latter group it may be reasonable to consider admission to intensive care only if the patient would be considered for liver transplantation.

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