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What's new in the management of severe acute pancreatitis?

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Introduction

Acute pancreatitis (AP) is a leading cause of hospitalization for gastrointestinal disorders [1]. Because of a substantially high mortality of up to 20–30 % in severe cases, early identification of patients who might require transfer to an intensive care unit (ICU) is essential [2].

What is new in the assessment of severity?

The original Ranson criteria from 1974, last modified in 2012, have been followed by several new and in part much more complex scoring systems; however, these have only increased diagnostic performance modestly (AUC from 0.57 to 0.74) [3]. Recent findings suggest that the presence of under- or overweight, development or persistence of organ failure, and assessment of biomarkers, such as cytokine levels might help to further improve identification of high-risk patients [4, 5] (Fig. 1).

What is new in therapy?

Several interventions have been identified as critical within 48 h, here in particular fluid resuscitation, analgesia and nutritional support.

Fluid therapy

Sustainable scientific and in particular clinical data on how to guide fluid therapy in this disease are still scarce. A recent review underlined the concept of early aggressive resuscitation, guided by the clinical estimation, and the assessment of BUN and haematocrit levels [6]. Recent results from a small retrospective single-centre cohort study seem to support such an aggressive approach in severe AP, whereas data from another, but prospective study reported that excessive hydration (10–15 ml/kg/h), where the goal was set to obtain a haematocrit of 35 %, resulted in increased organ failure, respiratory insufficiency and mortality [7, 8]. Whether guiding fluid therapy by cardiac output measurements and/or assessment of fluid responsiveness will lead to improvements in the

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management of this important therapeutic action with positive effects of outcome, as shown in recent experimental studies, needs to be confirmed in clinical settings [9].

Analgesia

Because of the severity of pain in severe AP, opioids are widely used. However, there is still uncertainty whether their side effect of inducing spasms of the smooth muscles may hide the resolution of the disease or even induce additional pain. Data of a recent Cochrane analysis do not support those concerns, but, as stated by the authors, this analysis is founded only on a very limited number of heterogeneous trials (Cochrane Database Syst Rev Jul 26;7:CD009179).

Epidural anaesthesia, which by far would be most effective in pain control, seems to beneficially influence the course of disease by improving pancreatic microcirculation and tissue oxygenation [10]. However, concerns with regard to concomitant derangements of coagulation and systemic inflammation so far have prevented its broader clinical use.

Nutritional support

Because enteral nutrition can stimulate pancreatic and intestinal secretions, the pancreatic rest concept has been a dogma in managing severe AP. However, bowel rest is associated with intestinal atrophy, bacterial overgrowth, and is responsible for elevated endotoxin and cytokines levels, bacterial translocation and SIRS induction. This is associated with a higher risk of infected pancreatic necrosis. So, because of its beneficial effects on tissue of the intestinal mucosa and the splanchnic blood flow, the concept that enteral nutrition 'worsens' pancreatitis has diminished greatly over recent years. In a recent meta-analysis including eight randomized controlled studies and 381 patients, enteral nutrition compared with par-enteral nutrition decreased infectious complications and mortality [11]. The use of early enteral nutrition (within 48 h of admission) has proven to be beneficial in patients with AP as it improves clinical outcomes by reducing the number of infections, particularly pancreatic infections (OR 0.49; 95 % CI 0.31–0.78) [12]. Recently, in less severe illness (APACHE II score 11; 6 % of the patients with multiple organ failure), a trial did not show the superiority of enteral nutrition within 24 h compared with oral diet after 72 h, in reducing the rate of infection or death [13]. On the basis of the assumption that gastric food administration increases the risk of abdominal pain exacerbation, nasojejunal feeding has long been favoured. However, exclusive gastric feeding succeeds with the delivery of nutritional targets in 90 % of patients [14]. The type of dietary mixture used did not appear decisive, and the effect of immunonutrition, glutamine supplementation and probiotics has not been demonstrated (Cochrane Database Syst Rev Mar 23;3:CD010605).

How is infected necrosis managed?

Infected necrosis occurs in 40–70 % of patients in the second or third week of the illness and is the leading cause of late mortality. The onset or worsening of organ failure in a septic context must raise suspicion of infected necrosis, and fine needle CT-guided aspiration should be considered. Antibiotics should be administered as soon as the results of the Gram stain are available. More conservative intervention than surgical necrosectomy now predominates. A step-up approach of percutaneous drainage followed, if necessary, by a minimally invasive surgical necrosectomy significantly reduces the rate of major complications and mortality by 29 % compared with open surgery [15]. Mouli et al. recently reported that a conservative initial approach with antimicrobial therapy with or without PCD was a successful approach for 64 % of patients with infected necrosis [16]. Moreover, postponement of a surgical necrosectomy provides an opportunity for acute collections to become walled-off and liquefied. A randomized study with a very small number of patients requiring secondary pancreatic debridement found endoscopic transgastric necrosectomy to be superior to surgical necrosectomy with respect to the overall rate of major complications or mortality (20 vs. 80 %) [17].

What do we do for biliary pancreatitis?

Gallstone disease is ranked first among the causes of pancreatitis in all the series (40–70 %) and can progress rapidly to severe AP. Although transabdominal ultrasonography (US) exhibits low sensitivity (ranging from 20 to 50 %) for detecting choledocholithiasis, repeated examinations indicate an accuracy rate as high as 83 % [18]. However, endoscopic ultrasound is clearly superior, with a sensitivity and specificity greater than 90 % in the detection of bile duct stones. A recent Cochrane Database search found no benefit from early ERCP with respect to mortality and local complications, claiming that ERCP is not needed in patients without evidence of biliary obstruction (Cochrane Database Syst Rev May 16;5:CD009779). In contrast, urgent ERCP within the first 24 h is indicated in severe AP with co-existing cholangitis or biliary obstruction [19] (Fig. 1).

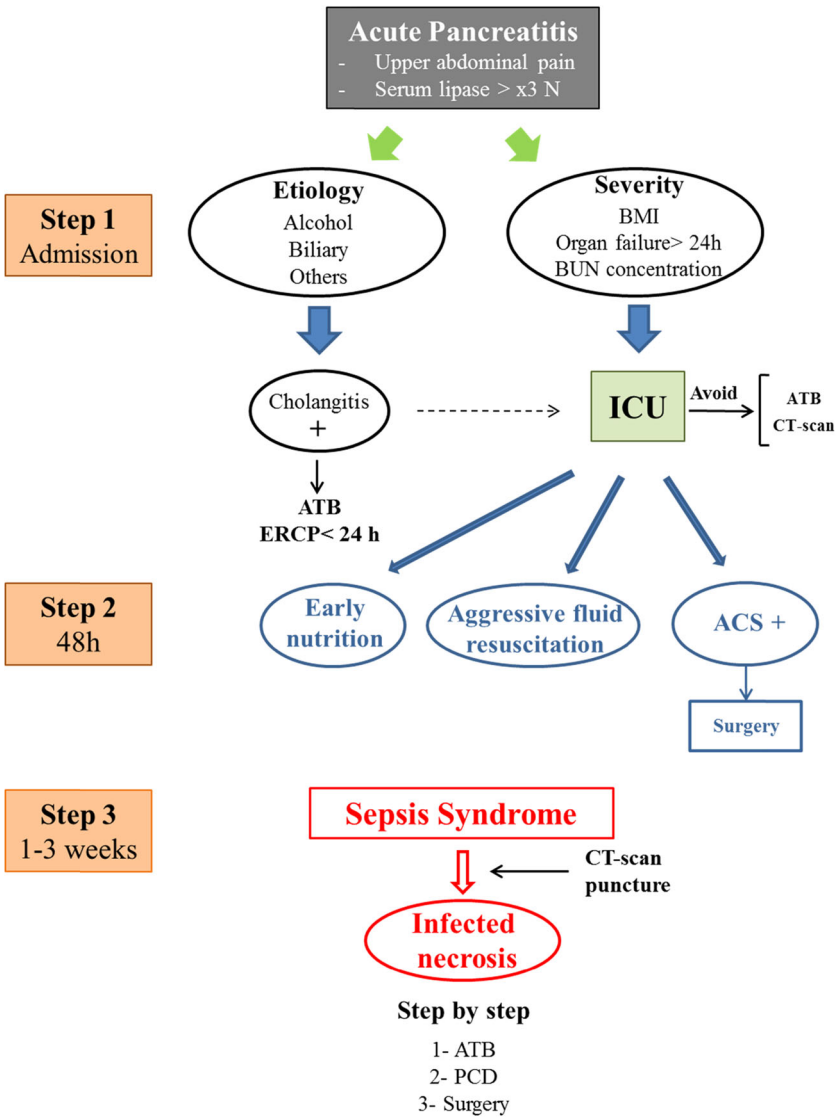

Fig. 1 Management of severe pancreatitis. *BMI* body mass index, *ATB* antibiotics, *ERCP* endoscopic retrograde cholangiopancreatography, *ACS* abdominal compartment syndrome, *PCD* percutaneous (or endoscopic) drainage

What about intra-abdominal hypertension and abdominal compartment syndrome?

The overall incidence of intra-abdominal hypertension (IAH) and abdominal compartment syndrome (ACS) in patients with severe AP is around 50–75 and 10–25 %, respectively [20]. The development of IAH and ACS in these patients has a major impact on morbidity and mortality and results from a combined effect of the inflammatory process itself and the iatrogenic aggressive fluid resuscitation. Raised intra-abdominal pressure causes upward shift of both hemidiaphragms and leads to compression atelectasis and hypercapnia. This, in combination with bilateral pleural effusions, may result in severe hypoxia.

When all non-operative measures fail to decrease intra-abdominal pressure and especially in the setting of primary ACS, one should consider immediate midline decompressive laparotomy since this can be life-saving. Newer and less-invasive methods have been recently suggested. A subcutaneous linea alba fasciotomy (SLAF) can be performed by utilizing three short horizontal skin incisions with the peritoneum closed avoiding a true open abdomen. SLAF needs further clinical evaluation and does result in a giant midline hernia with associated need for surgery at a later stage.

Conflicts of interest The authors do not have a conflict of interest.

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