International Journal of Healthcare Sciences ISSN 2348-5728 (Online)
Vol. 4, Issue 2, pp: (662-668), Month: October 2016 - March 2017, Available at: www.researchpublish.com

Overview of Complication and Management of Acute Pancreatitis

[1]Ahmed abdulghani abdulmajeed sindi, [2]Nasser Awadh Saeed Alshehri,
[3]Saleh Hassan Abdullah Almuntashiri, [4]Rayan azeb alharthi, [5]Faris AbdulAziz Jawmin,
[6]Mohammed Nawar Awadh Aljuaid, [7]Maram Saeed Al Bogami,
[8]Fahad saud fahad aljuaid, [9]Sultan meshal eidah Alrabie, [10]Turki muteb s alotaibi,
[11]Tawfiq Zuhair Abdullah Al Laylah

Abstract: **Acute pancreatitis (AP) is associated with high morbidity and mortality due to the development of extra-pancreatic and pancreatic necrosis, their subsequent infection and multisystem organ failure. We aimed by this overview study to discuss the complications mostly occur during or following an Acute pancreatitis, and also we intend to discuss the treatment strategies for AP and these complications following after. We conducted an electronic search for the major databases; MIDLINE, and Embase for all relevant studies that could be eligible for the aim of our review, and this included all studies publish through past period up to December 2016, we searched by using some Mesh terms such; acute pancreatitis, complications, AP, sever acute pancreatitis, treatment of AP, antibiotic for AP.The management of AP varies depending on the severity and the type of problem that requires treatment. The primary principle of intervention for example in necrotizing pancreatitis is that there is no unique treatment that is ideal for all patients. The best method is a multidisciplinary one that is versatile to the individual patient. For that reason, for the management of such complicated disease entities, a multidisciplinary team method is necessary, and the final selection of the optimum treatment of sever AP will depend upon numerous factors, consisting of the expertise offered at an offered center, specific patient qualities and risk assessment findings.**

Keywords: **Acute Pancreatitis, MIDLINE.**

1. INTRODUCTION

Acute pancreatitis (AP) is associated with high morbidity and mortality due to the development of extra-pancreatic and pancreatic necrosis, their subsequent infection and multisystem organ failure (MOF) [(1,2,3)]. Regardless of overall minimized death in the last years, AP is a terrible disease that is connected with mortality ranging from less than 10% to as high as 85%, according to various research studies [(1,4,5,6)]. The management of sever AP is complicated because of the limited understanding of the pathogenesis and multi-causality of the disease, unpredictability in outcome forecast and couple of efficient treatment techniques. Typically, sterile necrosis can be handled conservatively in the majority of cases with a low mortality rate (12%) [(2,7)]. Infection of pancreatic necrosis can be observed in 25%-70% of patients with necrotizing disease; it is usually accepted that the infected non-vital tissue ought to be eliminated to control the sepsis [(1,8,9)].

Extreme AP establishes in two stages (**Figure 1**) [(10)]. Throughout the first 1-2 weeks, a pro-inflammatory action takes place, which results in systemic inflammatory respiratory syndrome (SIRS), a sterile response where sepsis or infection seldom takes place. If the SIRS is extreme, then pro-inflammatory arbitrators can cause early numerous (breathing, cardiovascular, kidney, and hepatic) organ failure. In parallel, pancreatic necrosis establishes, usually within the first 4 days after the onset of signs. The level of pancreatic necrosis is not fixed and might advance as the disease develops throughout the very first 2 weeks [(11)]. In the early phase of serious pancreatitis, SIRS can be found in the lack of significant pancreatic necrosis, the majority of patients with extreme early organ dysfunction will have pancreatic necrosis that is evident on computed tomography scan [(4,12)].

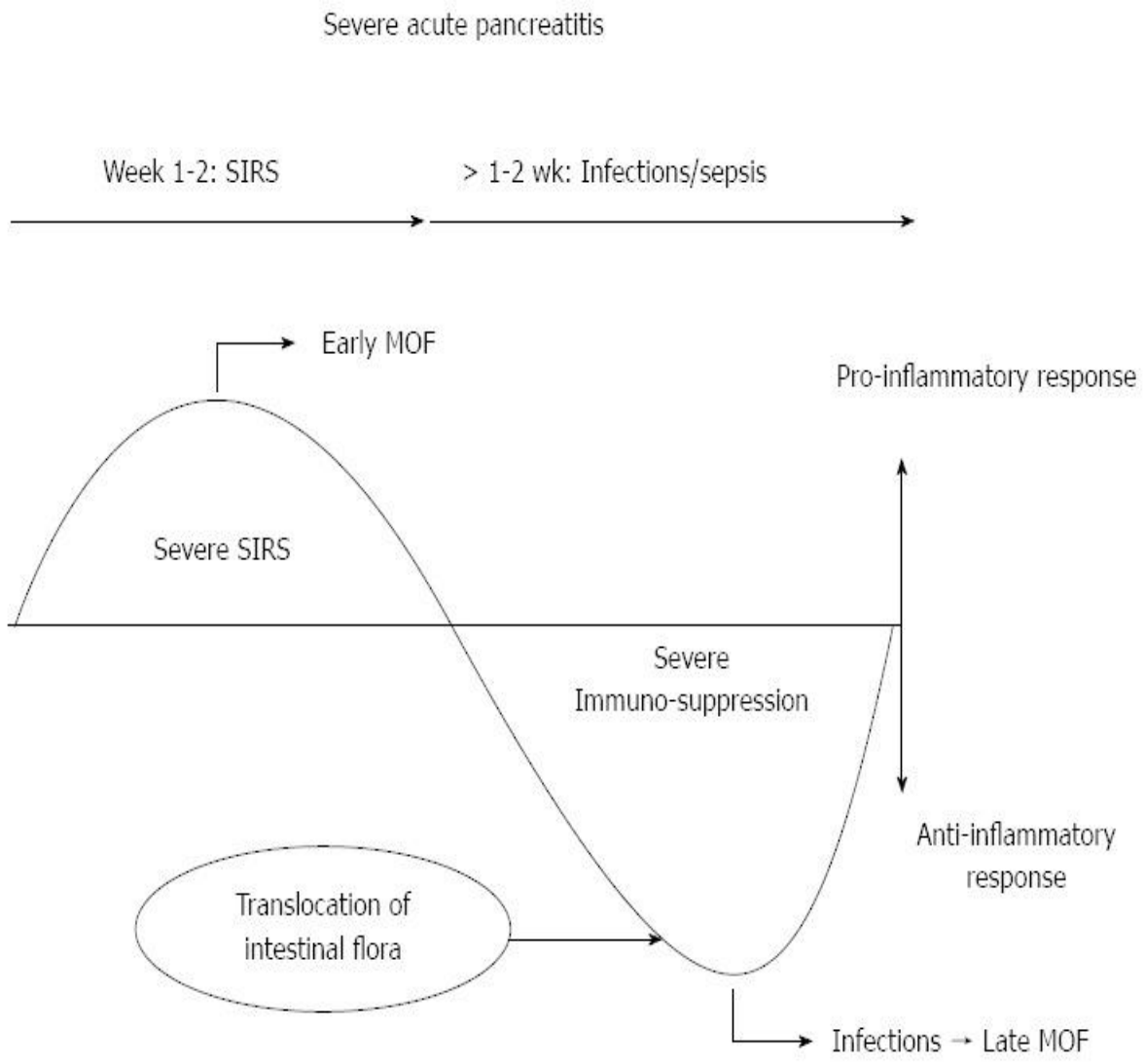

Figure 1: Natural clinical course of severe acute pancreatitis. SIRS: Systemic inflammatory response syndrome; MOF: Multisystem organ failure. [10]

We aimed by this overview study to discuss the complications mostly occur during or following an Acute pancreatitis, and also we intend to discuss the treatment strategies for AP and these complications following after.

2. METHODS

We conducted an electronic search for the major databases; MIDLINE, and Embase for all relevant studies that could be eligible for the aim of our review, and this included all studies publish through past period up to December 2016, we searched by using some Mesh terms such; acute pancreatitis, complications, AP, sever acute pancreatitis, treatment of AP, antibiotic for AP.

We restricted our search for only English language published reviews, and randomized control studies, and guidelines, that are human trials only.

3. RESULTS & DISCUSSION

Complications associated with AP:

We identified one study [13] which summarized the main complications in the early phases of severe acute pancreatitis in (Table 1) [13]. Following this table, we would like to discuss the most common of mentioned complication, which are Biliary Obstruction, and multi-organ failure.

Table1: Early complications in SAP (within the first 2 weeks) [13]

A.	Biliary obstruction
B.	Multi-organ failure, deterioration
C.	Early infection of the necrosis
D.	Peritonitis
E.	Haemorrhage
F.	Extensive sterile necrosis
G.	Wirsung rupture

A. Biliary obstruction

The anatomical relationship of the Common bile duct (CBD) with the head of the pancreas is an essential factor influencing the nature of the stenosis in CP. In approximately 85% of individuals, the CBD traverses the pancreatic head and is adjacent posteriorly in the remainder [14]. The intrapancreatic portion of the CBD differs in length from 1.5 to 6 cm, which accounts for the irregularity of stricture lengths seen in medical practice [15]. Common bile duct stricture (CBDS) most cause of biliary blockage in AP and it happens as a consequence of frequent severe inflammatory episodes which might eventually result in a periductal fibrotic stricture [16]. This occurs more typically in sophisticated AP, with the highest incidence in the calcific version [17,18]. Majority of the patients with gallstone (biliary) pancreatitis recover without significant sequelae,15-30% have serious episodes needing multidisciplinary care to guarantee the finest result [19]. Complications of acute biliary pancreatitis, both local (necrosis, pseudocyst development, abscesses, hemorrhage) and systemic (pleural effusion, adult respiratory distress syndrome (ARDS), renal deficiency, multi-organ failure) frequently require intensive care unit (ICU) management [19,20].

B. Multi-organ failure:

The one identified study [21] showed that although the occurrence of organ failure in sterilized necrosis was slightly higher than that in infected necrosis (66.0% vs 59.3%), there was no distinction in the occurrence of organ failure in sterile necrosis compared with contaminated necrosis. The incidence of organ failure increased with increased degree of necrosis, however patients with increased quantities of necrosis did not have actually increased frequency of organ failure (**Table 2**) [21].

Other research study [22] the death rate was 30% in patients with several organ failures, and was 8% in those with single organ failure [22]. but in previous research study [21] revealed the mortality rate was 45% (9/20) in patients with numerous organ failure, and was 11% (3/27) in those with single organ failure (**Table 3**) [21]. Halonen et al [23] compared several organ dysfunction (MOD) rating, consecutive organ failure assessment (SOFA) score, and logistic organ dysfunction (LOD) score in anticipating healthcare facility death rates of 178 Sever AP patients. Isenmann et al. [22] reported that the occurrence of organ failure was determined by the degree of necrosis in patients with sterile necrosis while, in infected necrosis, there was no connection with the extent of the necrosis. McKay et al. [24] observed that, while pancreatic necrosis is related to organ failure, nearly half of the patients with multi-organ failure have no significant necrosis.

Table 2: Relationship between amount of necrosis and organ failure in 74 patients [21]

Amount of necrosis (%)	Organ failure (*n* = 47)	No. organ failure (*n* = 27)
< 33%	21 (55.3%)	17 (44.7%)
33%-50%	11 (64.7%)	6 (35.3%)
> 50%	15 (78.9%)	4 (21.1%)

Note: $\chi^2 = 3.0784$, $P > 0.05$.

Table 3: Number of patients with organ failure in 74 patients [21]

Organ failure	Morbidity (%)	Mortality (%)
Multiple organ failure	20 (27.0%)	9 (45%)
Specific single organ failure		

Organ failure	Morbidity (%)	Mortality (%)
Pulmonary failure	17 (23.0%)	3 (17.6%)
Renal failure	0	0
Cardiovascular failure	0	0
Hepatic failure	7 (9.4%)	0
Neurologic failure	0	0
Gastrointestinal failure	3 (4.1%)	0

Management of acute pancreatitis:

The management of acute pancreatitis has been questionable over the past decades, varying between a conservative medical technique on the one hand and an aggressive surgical approach on the other. There has been excellent improvement in understanding of the natural course and pathophysiology of intense pancreatitis over the past years [4,22]. The scientific course of severe pancreatitis varies from a moderate temporal type to an extreme necrotising disease. Most episodes of severe pancreatitis (80%) are moderate and self-limiting, decreasing spontaneously within 3-- 5 days. Patients with moderate pancreatitis react well to medical treatment, requiring little bit more than intravenous fluid resuscitation and analgesia [4]. In contrast, serious pancreatitis is defined as pancreatitis related to organ failure and/or local issues such as necrosis, abscess development, or pseudocysts. Serious pancreatitis can be observed in 15-- 20% of all cases [25,26]. In general, extreme pancreatitis establishes in 2 phases. The very first two weeks after onset of signs are characterized by the systemic inflammatory action syndrome (SIRS). Release of proinflammatory mediators is believed to contribute to the pathogenesis of SIRS associated lung, cardiovascular, and renal deficiency [5,27,28]. In parallel, pancreatic necrosis establishes within the very first four days after the start of signs to its complete extent [12].

There are two primary goals in the preliminary treatment of patients with intense pancreatitis. The first is to offer helpful treatment and to treat specific complications which might take place. The 2nd is to restrict both the seriousness of pancreatic inflammation and necrosis and the systemic inflammatory response by particularly disrupting their pathogenesis. Due to its high death, early surgical intervention has no function in these patients [29]. It is normally accepted that all patients with signs of moderate to serious acute pancreatitis should be confessed to an intensive care unit and referred too specialized centers for maximum helpful care [25,30]. As complications may develop at any time, frequent reassessment and continuous tracking is essential. The most crucial encouraging treatment is adequate and prompt fluid resuscitation with intravenous fluids and supplemental oxygen, with a liberal sign for helped or managed ventilation to guarantee ideal oxygen transport [25,30,31,32].

Hydration and nutrition support for patient with AP and pain managment:

Aggressive intravenous fluid replacement is crucial to deal with fluid losses caused by 3rd area shifts, vomiting, diaphoresis, and increased vascular permeability triggered by inflammatory conciliators. Clinically, the adequacy of fluid resuscitation need to be kept an eye on in terms of crucial signs, urinary output, and hematocrit at 12 and 24 hours after admission (particularly for patients with hemoconcentration on admission) [34]. A 2nd important repercussion of hypovolemia is intestinal anemia. Anemia increases intestinal permeability to bacteria and endotoxins, a crucial reason for secondary pancreatic infection [33].

Appropriate pain management with opiate analgesics is necessary for treatment of extreme pain related to intense pancreatitis. Patient-controlled analgesia is often valuable for good pain control. Tracking of oxygenation while on high-dose opiate medications is essential. According to current American College of Gastroenterology standards, initial routine oxygen shipment via a nasal cannula is suggested for all patients with severe pancreatitis [33].

AP is defined by marked nutritional depletion, and nutritional assistance is required to attain a favorable nitrogen balance. The patients are parenterally fed since these patients might often provide with paralytic ileus and keeping the pancreas at rest is mandatory. Parenteral nutrition must be started, and positive nitrogen balance must be gotten in the first 72 h after the start of SAP. Enteral nutrition starting in the early stage of SAP is superior to total parenteral nutrition unless paralytic ileus is present [35]. This favorable impact is most likely attained using enteral nutrition that supports maintenance of the intestinal barrier. Continuous tube feeding with peptide-based formulae is possible in the majority of patients, and the jejunal path is advised if gastric feeding is not tolerated by the patient. Integrated parenteral and enteral feeding should be

set up (36)if the volume of enteral nutrition tolerated by the patient is insufficient to accomplish sufficient calorie assistance.

When patients are not likely to be able to eat for 7 days, Nutritional assistance ought to be thought about. To compare the safety and medical outcomes of parenteral and enteral nutrition in patients with intense pancreatitis, a meta-analysis of six research studies conducted in 2004 revealed that enteral nutrition was related to a significantly lower incidence of infections (relative risk 0.45; 95% confidence interval 0.26-0.78, P = 0.004), fewer surgical interventions to manage pancreatitis (0.48, 0.22-1.0, P = 0.05), and shorter medical facility stays (mean reduction 2.9 days, variety 1.6 - 4.3 days, P < 0.001). There was no substantial distinction in mortality (relative risk 0.66, 0.32-1.37, P = 0.3) [37].

Antibiotics treatment of AP:

The use of prophylactic prescription antibiotics to prevent pancreatic infection is not recommended for patients with necrotizing pancreatitis [33]. This according to guideline which is based upon 2 randomized research studies, the latter of which was a multicenter, prospective, double-blind, placebo-controlled study carried out in 32 centers in North America and Europe [38,39]. Pancreatic or peripancreatic infection developed in 18% (9 of 50) of patients in the group treated with meropenem, compared with 12% (6 of 50) of patients taking placebo (P = 0.401). The overall mortality rate was 20% (10 of 50) in the meropenem group and 18% (9 of 50) in the placebo group (P = 0.799). Surgical intervention was required in 26% (13 of 50) of the patients taking meropenem and 20% (10 of 50) of the patients taking placebo (P = 0.476). This study showed no substantial distinctions between the treatment and placebo groups for pancreatic or peripancreatic infection, death, or requirement for surgical intervention, and therefore did not support early prophylactic antimicrobial use in patients with serious intense necrotizing pancreatitis [39].

4. CONCLUSION

The management of AP varies depending on the severity and the type of problem that requires treatment. The primary principle of intervention for example in necrotizing pancreatitis is that there is no unique treatment that is ideal for all patients. The best method is a multidisciplinary one that is versatile to the individual patient. For that reason, for the management of such complicated disease entities, a multidisciplinary team method is necessary, and the final selection of the optimum treatment of sever AP will depend upon numerous factors, consisting of the expertise offered at an offered center, specific patient qualities and risk assessment findings. Patients according to the type of acute pancreatitis and characterize associated fluid collection and necrosis. This in turn can much better direct treatment options, whether percutaneous drainage by intervention radiology or endoscopic management versus surgical necrosectomy. Overall, effective management of intense pancreatitis needs a multidisciplinary approach with coordination of several subspecialty services consisting of diagnostic and interventional radiology, gastroenterology, and surgery.

REFERENCES

[1] Werner J, Feuerbach S, Uhl W, Büchler MW. Management of acute pancreatitis: from surgery to interventional intensive care. Gut. 2005;54:426–436.

[2] van Baal MC, van Santvoort HC, Bollen TL, Bakker OJ, Besselink MG, Gooszen HG. Systematic review of percutaneous catheter drainage as primary treatment for necrotizing pancreatitis. Br J Surg. 2011;98:18–27.

[3] Zerem E, Imamović G, Sušić A, Haračić B. Step-up approach to infected necrotising pancreatitis: a 20-year experience of percutaneous drainage in a single centre. Dig Liver Dis. 2011;43:478–483.

[4] Buter A, Imrie CW, Carter CR, Evans S, McKay CJ. Dynamic nature of early organ dysfunction determines outcome in acute pancreatitis. Br J Surg. 2002;89:298–302.

[5] Johnson CD, Kingsnorth AN, Imrie CW, McMahon MJ, Neoptolemos JP, McKay C, Toh SK, Skaife P, Leeder PC, Wilson P, et al. Double blind, randomised, placebo controlled study of a platelet activating factor antagonist, lexipafant, in the treatment and prevention of organ failure in predicted severe acute pancreatitis. Gut. 2001;48:62–69.

[6] Horvath K, Freeny P, Escallon J, Heagerty P, Comstock B, Glickerman DJ, Bulger E, Sinanan M, Langdale L, Kolokythas O, et al. Safety and efficacy of video-assisted retroperitoneal debridement for infected pancreatic collections: a multicenter, prospective, single-arm phase 2 study. Arch Surg. 2010;145:817–825.

[7] Banks PA, Freeman ML. Practice guidelines in acute pancreatitis. Am J Gastroenterol. 2006;101:2379–2400.

[8] Beger HG, Rau B, Mayer J, Pralle U. Natural course of acute pancreatitis. World J Surg. 1997;21:130–135.

[9] Büchler MW, Gloor B, Müller CA, Friess H, Seiler CA, Uhl W. Acute necrotizing pancreatitis: treatment strategy according to the status of infection. Ann Surg. 2000;232:619–626.

[10] Zerem E. Treatment of severe acute pancreatitis and its complications. *World Journal of Gastroenterology : WJG*. 2014;20(38):13879-13892. doi:10.3748/wjg.v20.i38.13879.

[11] Freeman ML, Werner J, van Santvoort HC, Baron TH, Besselink MG, Windsor JA, Horvath KD, vanSonnenberg E, Bollen TL, Vege SS. Interventions for necrotizing pancreatitis: summary of a multidisciplinary consensus conference. Pancreas. 2012;41:1176–1194.

[12] Beger HG, Bittner R, Block S, Büchler M. Bacterial contamination of pancreatic necrosis. A prospective clinical study. Gastroenterology. 1986;91:433–438.

[13] Bassi C, Falconi M, Sartori N, Bonora A, Caldiron E, Butturini G, Salvia R, Pederzoli P. The role of surgery in the major early complications of severe acute pancreatitis. Eur J Gastroenterol Hepat. (1997);9:131–136.

[14] Hollinghead W. The lower part of the common bile duct, a review. Surg Clin North Am. 1957;37:939–52.

[15] Eckhauser F, Knol J, Strodel W, et al. Common bile duct strictures associated with chronic pancreatitis. Am Surg. 1983;49:350–8.

[16] Sarles H, Sahel J. Cholestasis and lesions of the biliary tract in chronic pancreatitis. Gut. 1978;19:851–7.

[17] Scott J, Summerfield JA, Elias E, et al. Chronic pancreatitis: a cause of cholestasis. Gut. 1977;18:196–201.

[18] Juttner H, Renner I, Richman R, et al. Evaluation of obstructive jaundice in chronic pancreatitis. Gastroenterology. 1976;70:A-40/898.

[19] Death from acute pancreatitis. MRC Multicenter Trial Glucagon Aprotinin. Lancet. 1977;2:632–5.

[20] McFadden DW. Organ failure and multiple organ system failure in pancreatitis. Pancreas. 1991;6:37–43.

[21] Zhu A-J, Shi J-S, Sun X-J. Organ failure associated with severe acute pancreatitis. *World Journal of Gastroenterology*. 2003;9(11):2570-2573. doi:10.3748/wjg.v9.i11.2570.

[22] Isenmann R, Rau B, Beger HG. Bacterial infection and extent of necrosis are determinants of organ failure in patients with acute necrotizing pancreatitis. Br J Surg. 1999;86:1020–1024.

[23] Halonen KI, Pettilä V, Leppäniemi AK, Kemppainen EA, Puolakkainen PA, Haapiainen RK. Multiple organ dysfunction associated with severe acute pancreatitis. Crit Care Med. 2002;30:1274–1279.

[24] McKay CJ. When should we be concerned for pancreatic necrosis? Discussion. World J Surg 2006; 30:2234-35.

[25] Uhl W, Warshaw A, Imrie C, *et al.* IAP Guidelines for the surgical management of acute pancreatitis. Pancreatology 2002;2:565–73.

[26] Bradley ELD. A clinically based classification system for acute pancreatitis. Summary of the International Symposium on Acute Pancreatitis, Atlanta, Ga, September 11–13, 1992. Arch Surg 1993;128:586–90.

[27] Norman J . The role of cytokines in the pathogenesis of acute pancreatitis. Am J Surg 1998;175:76–83.

[28] Werner J, Z'Graggen K, Fernandez-del Castillo C, *et al.* Specific therapy for local and systemic complications of acute pancreatitis with monoclonal antibodies against ICAM-1. Ann Surg 1999;229:834–40.

[29] Mier J, Leon E, Castillo A, et al. Early versus late necrosectomy in severe necrotzing pancreatitis. Am J Surg 1997;173:71–5.

[30] United Kingdom guidelines for the management of acute pancreatitis. Gut 1998;42:1–13.

[31] Mier J, Leon E, Castillo A, *et al.* Early versus late necrosectomy in severe necrotzing pancreatitis. Am J Surg 1997;173:71–5.

[32] Sigurdson G . Acute pancreatitis: therapeutic options in multiple organ failure. In: Büchler M, Uhl W, Friess H, *et al*, eds. Acute pancreatitis: novel concepts in biology and therapy. Oxford: Blackwell Science Ltd, 1999:395–410.

[33] J.D. Baillargeon, J. Orav, V. Ramagopal, S.M. Tenner, P.A. Banks. Hemoconcentration as an early risk factor for necrotizing pancreatitis.Am J Gastroenterol, 93 (1998), pp. 2130–2134

[34] P.A. Banks, M.L. Freeman. Practice guidelines in acute pancreatitis. Am J Gastroenterol, 101 (2006), pp. 2379–2400.

[35] Takeda K, Takada T, Kawarada Y, Hirata K, Mayumi T, Yoshida M, Sekimoto M, Hirota M, Kimura Y, Isaji S, et al. JPN Guidelines for the management of acute pancreatitis: medical management of acute pancreatitis. J Hepatobiliary Pancreat Surg. 2006;13:42–47.

[36] Meier R, Ockenga J, Pertkiewicz M, Pap A, Milinic N, Macfie J, Löser C, Keim V. ESPEN Guidelines on Enteral Nutrition: Pancreas. Clin Nutr. 2006;25:275–284.

[37] P.E. Marik, G.P. Zaloga. Meta-analysis of parenteral nutrition versus enteral nutrition in patients with acute pancreatitis. Br Med J, 328 (2004), p. 1407

[38] R. Isenmann, M. Rünzi, M. Kron, S. Kahl, D. Kraus, N. Jung, et al. Prophylactic antibiotic treatment in patients with predicted severe acute pancreatitis: a placebo-controlled, double-blind trial. Gastroenerology, 126 (2004), pp. 997–1004

[39] E.P. Dellinger, J.M. Tellado, N.E. Soto, S.W. Ashley, P.S. Barie, T. Dugernier, et al. Early antibiotic treatment for severe acute necrotizing pancreatitis: a randomized, double-blind, placebo-controlled study. Ann Surg, 245 (2007), pp. 674–683