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Severe Acute Pancreatitis: Management and Prognosis Experience of the Intensive Care Unit at Moulay Ismail Military Hospital Meknes, Morocco

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Abstract **Original Research Article**

Introduction*:** Severe acute pancreatitis is considered "a true ICU disease" as all organs can be affected either initially or secondarily. The overall mortality rate for acute pancreatitis of all forms is 4-10%, which can reach 30% in severe forms. The aim of our study was to reveal and describe the prognostic, epidemiological, clinical, paraclinical, and evolutionary factors of severe acute pancreatitis. ***Patients and Methods: This retrospective study focused on cases of severe acute pancreatitis admitted to the intensive care unit of Moulay Ismail Military Hospital in Meknes, Morocco, between January 2017 and September 2018, involving 23 patients. The study detailed epidemiological, clinical, biological, radiological, and evolutionary aspects. ***Results*:** 23 cases of severe acute pancreatitis were recorded, with 68% women and 32% men, with an average age of 62 years. Biliary origin was the most common cause of severe acute pancreatitis (69%). The diagnosis was established based on a suggestive clinical picture associated with lipase levels >3x normal. Most patients presented to the hospital within 12 to 24 hours of symptom onset. Abdominal CT revealed a predominance of Balthazar stage D and E acute pancreatitis in 77% of cases. The severe acute pancreatitis rate among all hospitalized patients during our study period was 18%. The average length of stay in the ICU was 5 days (range 2-13 days). The outcome was marked by a 34% mortality rate. ***Conclusion*:** According to our study, the mortality rate for severe acute pancreatitis is 34%, highlighting the severity of this condition and the need for early and dynamic patient management.

Keywords: Severe Acute Pancreatitis - Intensive Care - Mortality - Management – Complications.

INTRODUCTION

Acute pancreatitis is an inflammation of the pancreatic gland resulting from the self-digestion of the pancreas by its own enzymes. This inflammatory process can resolve spontaneously or lead to significant mortality and morbidity in the case of severe acute pancreatitis, necessitating management in an intensive care unit. The positive diagnosis is based on the combination of clinical symptoms, elevated pancreatic enzymes, and/or radiological criteria on CT. Gallstones and alcoholism are the main etiologies. This retrospective descriptive study aims to determine the epidemiological, clinical, paraclinical, and therapeutic characteristics of severe acute pancreatitis and to identify certain prognostic factors. The study covers a series of cases collected in the intensive care unit of Moulay Ismail Military Hospital in Meknes, Morocco, over a 21-month period from January 2017 to September 2018.

MATERIALS AND METHODS

This is a retrospective study involving 23 patients admitted to the intensive care unit of Moulay Ismail Military Hospital in Meknes, Morocco, for severe acute pancreatitis over a 21-month period from January 2017 to September 2018. The study aims to specify the epidemiological, clinical, biological, radiological, therapeutic, and evolutionary aspects of these patients.

RESULTS

The average age of the patients was 64 years (ranging from 49 to 82 years). There was a marked female predominance (68%), with a sex ratio of 2.1. 82.6% of the patients were admitted through the emergency department, while 17.3% were admitted via

other departments. Abdominal pain was the most common clinical symptom, present in 100% of the patients. Associated clinical signs included nausea and vomiting in 78% of cases, followed by cessation of bowel movements and gas in 22% of cases. Most patients presented to the hospital within the first 24 to 48 hours following the onset of pain. Lipase levels were more than three times the normal value in all patients, with a median of 1682 IU/L (range 348-4420). Elevated CRP levels were found in 90% of cases, with a median of 284 mg/L (range 3-512). According to the Balthazar classification, patients who underwent abdominal CT 48 hours after the onset of pain were categorized as follows (Figure 1): Gallstones were the most common cause of acute pancreatitis in our series (71%). Among all patients admitted to Moulay Ismail Military Hospital for acute pancreatitis during the study period, 18% were hospitalized in the intensive care unit for severe acute pancreatitis, while 82% were hospitalized in the visceral surgery or gastroenterology departments. The length of stay in the intensive care unit ranged from 2 to 13 days. In our series, mortality was 34% among patients hospitalized in the intensive care unit for severe acute pancreatitis. Infection of the necrosis was a major mortality factor, responsible for 75% of deaths, while 25% of cases had multiorgan failure. Suspicion of necrosis superinfection generally requires percutaneous radiological drainage, which allows both diagnosis and therapeutic intervention in the least invasive manner, as was the case for 4 patients. Among the patients who underwent radiological drainage, 2 were found to have infections with BLSE Pseudomonas (extended-spectrum beta-lactamase) and Candida Albicans. Antibiotic treatment was proposed for our patients for curative purposes, with the type of antibiotic chosen based on the identified germ and the patient's clinical condition. ERCP (Endoscopic Retrograde Cholangiopancreatography) was proposed for one patient with severe biliary acute pancreatitis associated with cholangitis, which showed good evolution. The 16 patients with a biliary origin were transferred to the visceral surgery department for further management.

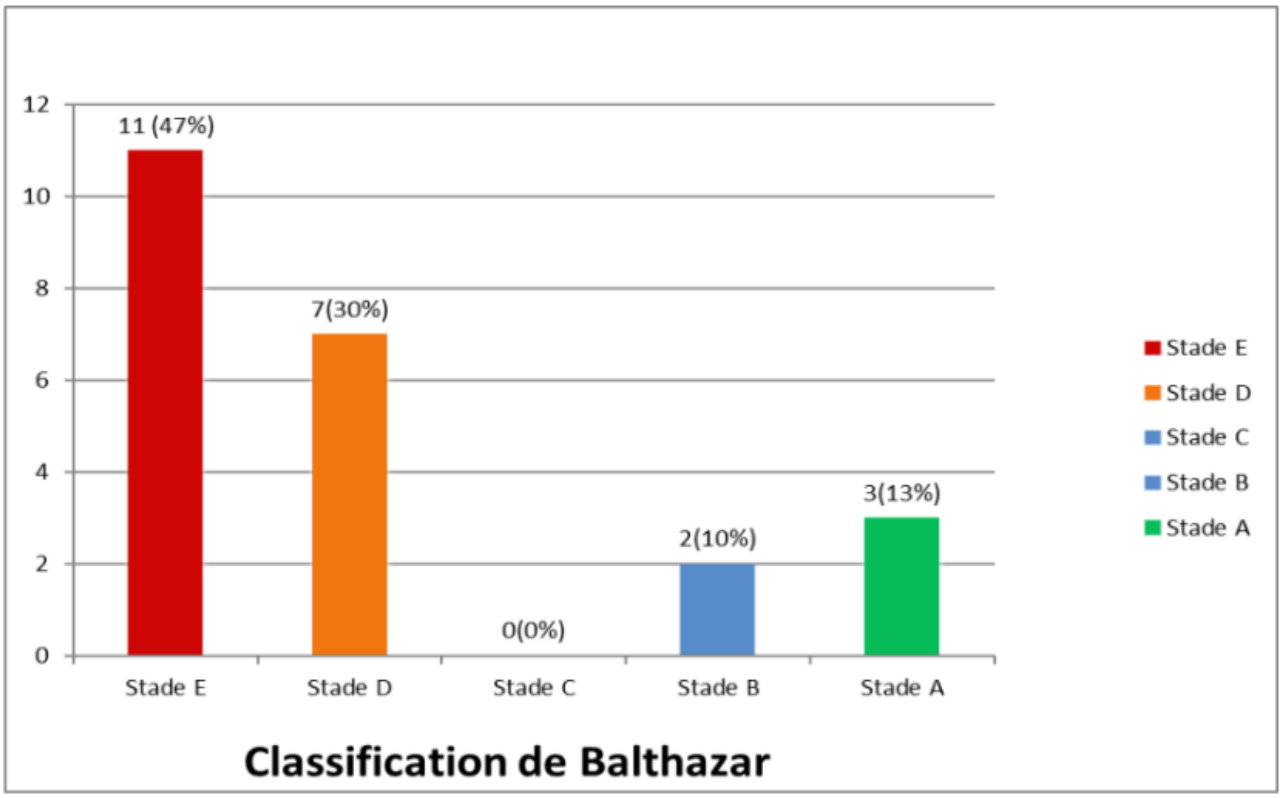

Figure 1: Distribution of patients according to the Balthazar classification

DISCUSSION

In our series, the average age was 64 years (49-82 years). Lankisch showed that the incidence of biliary-origin acute pancreatitis increases with age [1]. In our study, there was a female predominance (68%), similar to the results observed in Brahmi's study (65%) [2]. Most patients present to the hospital within 12 to 24 hours of symptom onset, consistent with the findings in the studies by Ann R Coll [3] and Ramjan M [4]. Abdominal pain was the primary symptom in all our patients (100%), followed by nausea and vomiting (78%) and cessation of bowel movements (22%). Lipase levels were more than three times the normal value in all patients. De Campos and M. Büchler [5] established that when circulating CRP levels remain above 100 mg/L during the first week, they predict necrosis with the same accuracy as CT examination (sensitivity of 85%). CRP is considered a potential marker of necrosis and severity [6]. In a British

study, a CRP level below 150 mg/L has a negative predictive value for necrosis of about 90% [7]. In our study, CRP was measured in all patients, with an average value of 284 mg/L at 48 hours (range 3-512 mg/L). Abdominal CT allows defining five stages of increasing severity, known as the BALTHAZAR score (Table 1). The combined performance of dynamic pancreatography with IV contrast injection precisely identifies the lesion by highlighting necrosis. Many Western series have shown a predominance of alcoholic acute pancreatitis, unlike Maghreb countries where biliary-origin acute pancreatitis remains predominant, consistent with our study where biliary lithiasis was the most common etiology of acute pancreatitis (Table 2). In our study, the length of hospitalization in the intensive care unit ranged from 2 to 13 days, with an average of 5 days, compared to 8.5 to 24.7 days with an average of 16.6 days in Lakhey, P.J.'s study [10], and 6 to 28 days with an average of 14 days in Koutroumpakis, E.'s study [11]. In our study, the mortality rate was 34.7%. According to Thibault Loupec, the overall mortality from pancreatitis, all forms combined, is about 3.7%, with the highest mortality rates concentrated in severe forms, reaching up to 30% [12].

Table 1: Classification of BALTHAZAR in series

Source	Stade D ou E	Autres stades
Adrian Culotto [25]	31,8%	27%
Qamous [26]	81%	19%
Ohara H. [27]	56%	27%
Notre étude	77%	23%

Table 2: distribution of patients according to the etiology of pancreatitis

Auteur	PA lithiasique	PA non lithiasique	
		Alcool	Autres
Xio- Yan Ligg [28]	48,9%	30,6%	20,5%
Ai-Jun-Zhu [9]	43,2%	56,7%	<1%
Magda A [29]	42%	53%	5%
Lévy et Ruszniewski [12]	37%	36%	27%
Rhazali [30]	55%	5,8%	39,2%
EL Amarti [10]	60%	7%	33%
Brahimi [6]	66,8	3,9%	
Aissaoui [13]	71,75%	1,17%	27,08%
Notre étude	69%	4%	25%

- **Recent Recommendations for Severe Acute Pancreatitis Management and Critical Review of Our Series:**

The diagnosis of acute pancreatitis is based on the association of two of the following three criteria: typical abdominal pain, elevation of pancreatic enzymes above three times the normal level, and imaging (CT, MRI, or ultrasound). It is recommended to measure lipase levels and abandon amylase measurement. CT can be used for positive diagnosis in cases of undiagnosed

abdominal emergencies. The initial assessment should include measuring liver enzymes, triglycerides, and calcium levels. An urgent abdominal ultrasound is mandatory to detect gallstones before they are potentially induced by fasting. Pancreatic MRI is essential to look for ductal abnormalities (especially a tumoral obstruction). Endoscopic ultrasound can diagnose 32 to 88% of cases by revealing biliary sludge or microcalculi not seen on ultrasound [13]. Abdominopelvic CT can be repeated at a distance, especially in case of acute pancreatitis recurrence. The best score for predicting the severity of pancreatitis is the systemic inflammatory response syndrome (SIRS) score, defined by the presence of two or more of the following conditions: temperature < 36°C or > 38°C; heart rate > 90/min; respiratory rate > 20/min or PaCO2 < 32 mmHg; leukocytosis > 12000/mm3 or < 4000/mm3 or presence of immature circulating forms (> 10% of cells). A SIRS persisting for more than 48 hours is associated with a 25% mortality rate versus 8% for transient SIRS [14]. A SIRS present on admission has a sensitivity of 100% but a specificity of 31% [15].

What is the Best Strategy to Predict the Evolution of Acute Pancreatitis at Admission? This reflection should be conducted along three axes: 1. Patient context (comorbidities, body mass index) 2. Evaluation of the presence or absence of SIRS 3. Evolution after initial therapeutic measures such as rehydration (persistence of SIRS, blood urea, creatinine).

What Are the Indications and Optimal Timing for Performing a CT scan? 1. Diagnostic doubt (possibly a non-contrast CT scan in a dehydrated patient) 2. Confirmation of severity based on the previously described criteria 3. Non-response to initial treatments or deterioration of the clinical condition.

The best time for an evaluation CT scan is between 72 and 96 hours after symptom onset. In most cases, the positive diagnosis of acute pancreatitis is not problematic. Early CT scan does not change the therapeutic strategy. Finally, a too early CT scan with contrast injection could worsen acute pancreatitis, not to mention potential nephrotoxicity.

When to Repeat a CT Scan During the Evolution? A CT scan should be repeated in case of non-improvement or, worse, deterioration of the clinical condition or when an interventional procedure is planned.

Indications for Transfer to Intensive Care According to Recent Recommendations Are as Follows: 1. Pulse < 40 or > 150 bpm, 2. Systolic blood pressure < 80 mmHg or mean pressure < 60 mmHg or diastolic blood pressure > 120 mmHg, 3. Respiratory rate > 35 breaths/min, 4. Serum sodium < 110 or > 170 mmol/L, 5. Serum potassium < 2 or > 7 mmol/L, 6. PaO2 < 50 mmHg, 7. pH < 7.1 or > 7.7, 8. Blood glucose > 44.4 mmol/L, 9. Serum calcium < 3.75 mmol/L, 10. Anuria, 11. Coma, 12. Persistent SIRS.

Fluid and Electrolyte Balance: Rehydration does not alter the risk and extent of necrosis but reduces the risk of SIRS, organ failure, and mortality. Therefore, it is a trivial but essential measure that should not be neglected. Ringer's lactate is more effective in preventing SIRS [16]. Infusion should be rapid at a rate of 5-10 ml/kg/h until improvement in biological parameters is achieved.

Should Antibiotics Be Given Preventively? The clear answer is NO. Preventive antibiotic use leads to the selection of germs, which is harmful not only to the patient but also to the hospital's bacterial ecology. This highlights the importance of being able to take samples, if necessary, from the necrosis to authenticate the infection.

Is Digestive Decontamination Recommended? The conclusions here are less clear-cut, as some studies have demonstrated an interest, but the level of evidence was deemed too low for such a recommendation.

Are Probiotics Recommended? The use of probiotics is not recommended. A randomized study showed higher mortality in the probiotic group compared to placebo without preventing necrosis infection [17].

What Is the Indication for Enteral Nutrition? All patients with severe acute pancreatitis or with predictive severity criteria should be placed on enteral nutrition. Several randomized studies and meta-analyses have shown that enteral nutrition is superior to parenteral nutrition in terms of preventing organ failure, systemic infections, the need for surgical intervention, and even mortality [18]. One study suggests that enteral nutrition should be started as soon as possible (< 48 hours) [19] not for nutritional reasons but to prevent infections secondary to bacterial translocations.

What Type of Enteral Nutrition? No specific type of enteral nutrition has shown a difference in efficacy. Therefore, classical polymeric nutrition can be administered. It is unnecessary to use elemental or immunonutrition, which are more expensive and offer no additional advantage.

Is There Still a Place for Parenteral Nutrition? Parenteral nutrition should only be administered in case of intolerance or inability to give enteral nutrition (e.g., abdominal compartment syndrome). The possibility of switching to enteral nutrition should be evaluated daily.

What Is the Indication for Early ERCP and Sphincterotomy in Biliary Acute Pancreatitis? ERCP is indicated in cases of biliary acute pancreatitis associated with cholangitis [20].

Indications for Biliary MRI and Endoscopic Ultrasound: The benefit of these two techniques is to avoid ERCP if there is no cholangitis by demonstrating the absence of stones in the main bile duct. Endoscopic ultrasound is superior to MRI for small stones less than 5 mm; it is indicated at a distance to "catch" the diagnosis of biliary lithiasis in a patient whose ultrasound was not demonstrative [13].

Indisputable Indications for Necrosectomy Are: 1. Suspected or demonstrated necrosis infection in a patient whose clinical condition is deteriorating, preferably when the necrosis is organized (usual delay > 4 weeks), 2. The appearance of organ failure several weeks after the onset of acute pancreatitis on organized necrosis, 3. Abdominal compartment syndrome, 4. Uncontrollable hemorrhage, 5. Mesenteric ischemia, 6. Gastric, intestinal, or biliary obstruction (related to a necrotic mass).

What Is the Role of Necrosis Puncture? Necrosis puncture is recommended in the presence of infection signs, allowing to identify which necrosis flow is infected, the nature of the germ, and its antibiogram.

What Strategy to Adopt for Interventions: Radiological Drainage, Endoscopic, Surgical Necrosectomy?

The recommended strategy is to start with radioguided percutaneous drainage or endoscopy and, if necessary, proceed with surgery. This "step-up" approach has been demonstrated to be superior in a randomized trial [21].

When to Perform Cholecystectomy and Possibly Sphincterotomy?

1. In cases of mild acute pancreatitis, cholecystectomy should be performed as soon as possible during the same hospitalization, preferably before resuming oral feeding due to the high risk of short-term recurrence.
2. After severe acute pancreatitis, cholecystectomy should be postponed until the inflammatory flows have disappeared or the necrosis flows are organized. In this case, the patient should be kept on exclusive enteral nutrition for several weeks to allow regression of inflammatory phenomena. Alternatively, a cold ERCP with sphincterotomy may be proposed for a typically fine and lithiasis-free bile duct, allowing resumption of feeding while limiting the risk of recurrence. This approach is partially validated by a small study [22].

Should Cholecystectomy Be Performed After Sphincterotomy? If there are no surgical contraindications, cholecystectomy is recommended to avoid the risk of hepatic colic or cholecystitis (estimated risk of 10%) [23].

CONCLUSION

Managing severe acute pancreatitis requires multidisciplinary collaboration involving intensivists, gastroenterologists, radiologists, and surgeons. Numerous randomized studies have provided clear answers to very practical questions. Ongoing studies will further refine our understanding or illuminate obscure areas. By utilizing all these competencies and adopting a rigorous approach aligned with largely consensual recommendations, it should be possible to significantly reduce the morbidity and mortality of this purely inflammatory and reversible disease. Despite being retrospective, our study highlights a high mortality rate of 34% during the study period, underscoring the severity of this pathology and the need for early and dynamic management of these patients. Additionally, our study allowed us to discuss certain diagnostic and therapeutic aspects of this condition (within the limits of the data available from the reviewed records) in light of recent literature recommendations.

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