Acute pancreatitis complications and a method to improve the outcome

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Aims and objectives

Acute pancreatitis refers to acute inflammation of the pancreas and it is one of the most common disease of the gastrointestinal tract that can lead to potentially life threatening conditions. [1]

Patients with AP typically present with epigastric or left upper quadrant pain, which is usually described as constant with radiation to the back, chest, or flanks, but this description is non-specific. [5] The intensity of the pain is usually severe, but can be variable. The intensity and location of the pain do not correlate with severity. [6-9]

The diagnosis of acute pancreatitis is made by fulfilling two of the following three criteria [8]:

- Acute onset of persistent, severe epigastric pain (i.e. pain consistent with acute pancreatitis)
- Lipase/amylase elevation >3x the upper limit of normal
- Characteristic imaging features on CECT, MRI or US

Imaging is crucial for the detection of complications and to help guide treatment.

Once the diagnosis of acute pancreatitis is established, the treatment of the patient dependents on the early assessment of disease severity. The assessment, being based on certain parameters, it is very important in predicting clinical complications and for identifying potentially lethal attacks, which are known to occur in 2%-10% of patients with acute pancreatitis.[1,2]

Organ failure is frequently observed in severe pancreatitis, so it is recommended to use a multiple factor scoring. [14] Are known systems like Ranson, Imrie, Glasgow, but are large debates around them because can have poor predictive power. [3-5] By comparison with the others scoring systems, the multiple organ system failure seems to have a higher prediction, it has better clinical utility for evaluating patients on admission and at 48 h. It can be performed within a few hours of admission and can be repeated daily to monitor disease progression. [7] Therefore the purpose of this study was to evaluate the complications of acute pancreatitis, the outcome of them, and to reveal methods of improving the end results.
Methods and materials

This is a retrospective study for 6 year period, between 2009-2015... Were studied 140 patients (97 males and 43 females), the age between 18-75 years old, admitted in our hospital: Emergency County Hospital Brasov, with the diagnosis of acute pancreatitis. In order to evaluate the complication’s severity was used a multiple organ system failure scoring.

Parameters that were taken into account are:

• Medical history
• Repeated clinical examination
• Serological tests
• Complications
• The necessity of surgery
• Final outcome of patients [10]

All the patient underwent chest X-ray and ultrasonography; a computed tomography scan of the abdomen was performed whenever needed.

A MOSF scoring system was used in order to identify the severity and predicting the course of acute pancreatitis. This system is based on the sum of the failing organ system in the same day, score varied from 0 to 7. Score #1 means severe acute pancreatitis. [17]

Criteria for MOSF scale:

<table>
<thead>
<tr>
<th>ORGAN SYSTEM</th>
<th>Criteria for Multiple Organ System Failure (MOSF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Arterial blood pressure less than 50 mm Hg. In need of volume loading and/or vasoactive drugs to maintain systolic blood pressure above 100 mm Hg. Heart rate less 50 beats per minute. Ventricular tachycardia/fibrillation. Cardiac arrest. Acute myocardial infarction</td>
</tr>
<tr>
<td>Renal</td>
<td>Serum creatinine $\geq 3.5$ mg per dL (280 mmol per L). Dialysis/ultrafiltration needed</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>Respiratory rate less than 5 per minute or more than 50 per minute. Mechanical ventilation for 3 or more days or $\text{FiO}_2 &gt; 0.4$ and/or positive end-expiratory pressure $&gt; 5$ mm Hg</td>
</tr>
<tr>
<td>Hematologic</td>
<td>Hematocrit $\leq 20%$. Leukocyte count $\leq 300$ per mm$^3$ (0.3 x $10^9$ per L). Platelet count $\leq 50 \times 10^3$ per mL (50 x $10^9$ per L). Disseminated intravascular coagulation</td>
</tr>
<tr>
<td>Neurologic</td>
<td>Glasgow Coma Scale $\leq 6$ (in the absence of sedation)</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Stress ulcer necessitating transfusion of more than 2 units of blood per 24 hours. Acalculus cholecystitis. Necrotizing enterocolitis. Bowel perforation.</td>
</tr>
<tr>
<td>Hepatic</td>
<td>Total bilirubin level $\geq 3.5$ mg per dL (51 mmol per L) in the absence of hemolysis. ALT $&gt; 100$ U per L. [10]</td>
</tr>
</tbody>
</table>
Results

The most common symptom was represented by epigastric abdominal pain for 137 of cases, the next symptom as frequency was nausea, vomiting or bilious vomiting, followed by fever, jaundice and other symptoms. (Fig. 1)

Fig. 1: Most common symptoms - acute pancreatitis

References: RADIOLOGY, County Clinical Emergency Hospital of Brașov - Brasov/RO

Gallstone passage was the most common cause of acute pancreatitis 77 patients, followed by idiopathic causes 30 patients, alcohol abuse 22 cases and other causes such as: metabolic disorders, trauma and malignancy 11 patients. (Fig. 2)
The most common chest X-ray finding was bilateral pleural effusion seen in 48 patients. From all studied patients diagnosed with acute pancreatitis, 67% patients had a mild attack and severe pancreatitis was seen in 33% of patients. For 106 an abdominal CT scan was needed.

The most common local complication was:

- ascites in 45% of cases, (Fig.3)
Fig. 3: Contrast-enhanced CT scan of the upper abdomen showing peripancreatic non-enhancing areas of necrosis of the pancreas and ascites

References: RADIOLOGY, County Clinical Emergency Hospital of Brașov - Brasov/RO

- necrosis 32% (Fig.4)
Fig. 4: Contrast-enhanced CT scan of the upper abdomen showing peripancreatic and retro peritoneal edema. Large non-enhancing areas of necrosis are visible in the body and tail of the pancreas. Fluid collection with thick walls.

References: RADIOLOGY, County Clinical Emergency Hospital of Brașov - Brasov/RO

- locoregional collections 15% (Fig.4)
- other complications were: ARDS, renal failure, pancreatic abscesses, and infection of the pancreatic necrosis, vascular erosion, duodenal cystic dystrophy, portal ans splenic thrombosis and the poorest prognosis was encephalopathy.

Distant complication was seen in almost 20% patients - pancreatic pseudocyst. (Fig.5) Overall, mortality was seen 9% of cases, with a mortality rate of 33% in severe acute pancreatitis. Although conservative management was done in all patients to start with, then 15% of patients needed surgery.
Fig. 5: Contrast-enhanced CT scan of the upper abdomen showing a well-defined fluid collection in the retroperitoneum, just below the level of the pancreas consisting with pancreatic pseudocyst.

References: RADIOLOGY, County Clinical Emergency Hospital of Brașov - Brasov/RO

Was used a MOSF scoring system in order to assess the severity of acute pancreatitis. This system predicted the attack of severe acute pancreatitis in 56 patients (with a score over 1). Whereas the MOSF scoring system predicted the mild attack of acute pancreatitis in 84 patients. The sensitivity and specificity of the MOSF system in predicting the severity of attack in acute pancreatitis were 95% and 92%, respectively. CT scan has an important role in diagnosis of acute pancreatitis, its complications and extensive pancreatic necrosis that can be easy correlated with pancreatic sepsis. [10]
Conclusion

The most common local complication was ascites and peripancreatic fluid and the systemic one was pleural effusion. Other complication were: ARDS, renal failure, pancreatic abscesses, infection of the pancreatic necrosis, vascular erosion, duodenal cystic dystrophy portal thrombosis and the poorest prognosis was encephalopathy.

Fig. 6: Post surgical status (retro peritoneal malignant mass) patient has acute pancreatitis, biliary fistula and biloma. Contrast-enhanced CT scan of the upper abdomen showing a well-defined collection with blood density located in the tail of the pancreas.

References: RADIOLOGY, County Clinical Emergency Hospital of Bra#ov - Brasov/RO

The multiple organ system failure scoring correlated with enhanced CT abdominal scan help to identify and to monitors the high risk patients and deciding on therapy in order to
avoid risk of complications and decrease mortality.[10] Imaging is crucial for the detection of complications and to help guide treatment.
References


