Management of Acute Pancreatitis

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Acute Pancreatitis

• Acute inflammatory process of the Pancreas
• Mortality ranges:
  – 3% for interstitial edematous pancreatitis
  – 17% for pancreatic necrosis
Classification of Acute Pancreatitis

• Atlanta Classification – 2 categories
• 1. Interstitial edematous acute pancreatitis- inflammation of the pancreatic parenchyma and peripancreatic tissue without necrosis
• 2. Necrotizing pancreatitis- inflammation with necrosis, destruction of part of the pancreas
Severity of Pancreatitis

- Mild: absence of organ failure or systemic complications
- Moderate: no organ failure or transient organ failure (<48 hours) and/or local complications
- Severe: persistent organ failure (>48 hours) that may involve one or multiple organs.
Assessment of Disease Severity

• Clinical examination to assess for
• 1. Early fluid losses
• 2. Organ failure (cardiovascular, pulmonary, or renal)
• 3. Measure APACHE II score
• 4. Measure SIRS score
APACHE II scoring system

- Calculator scoring system
- Need the following:
  - Rectal temperature, MAP, HR, RR, A-a gradient or PO2, pH or HCO3, Na, Cr, Hct, WBC, Glasgow coma score, Age, presence of chronic diagnosis.
Systemic Inflammatory Response Syndrome (SIRS) score

- Diagnosis based on two or more of the following conditions
- Temp >38.3 or <36 C
- HR > 90 beats/min
- RR > 20 breaths/min or PaCO2 of < 32 mmHg
- WBC > 12,000 cells/ml, < 4000 cells/ml, or >10% bands
Assessment of Disease Severity

• Amylase and lipase are useful for diagnosis of acute pancreatitis.

• Serial Measurements of amylase and lipase are NOT useful:
  – They DO NOT predict disease severity.
  – They ARE NOT a prognostic tool.
  – They DO NOT alter management.

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Assessment of Disease Severity

- Routine CT scan is not recommended at initial presentation unless there is a diagnostic uncertainty.
- Pancreatic necrosis may only become clear 72 hours after the onset of acute pancreatitis. Please reserve CT scans for then and still only if necessary.
Indications for Intensive Care

- Patients with severe acute pancreatitis
- Patients with acute pancreatitis and one or more of the following:
  - HR <40 or >150 beats/min
  - SAP <80 mmHg or MAP <60 mmHg or DAP >120 mmHg
  - RR > 35 breaths/min
  - Na <110 or >170 mmol/L
  - K <2 or >7 mmol/L
  - PaO2 <50 mmHg
  - pH <7.1 or >7.7
  - Serum glucose >800 mg/dL
  - Serum calcium >15 mg/dL
  - Anuria
  - Coma
Initial Management

• Supportive care with
• 1. Fluid resuscitation
• 2. Pain control
• 3. Nutritional support
Fluid Resuscitation

• Fluid replacement needs to be aggressive
• 5-10 ml/kg of NS or LR/hour to all patients unless cardiovascular, renal or other related comorbid factors preclude this rate.
• In patients with severe volume depletion that manifests as hypotension and tachycardia, provide more rapid repletion with 20 ml/kg of IVF over 30 minutes followed by 3 ml/kg/hr for 8-12 hours.
• In rare patients with hypercalcemia induced pancreatitis, do not use LR.
Fluid Resuscitation

• Fluid requirements should be reassessed at frequent intervals in the first 6 hours of admission

• And then reassessed for the next 24-48 hours at 6-12 hour intervals with cardiopulmonary examinations and assessment of urine output to assess affects of fluid on the body as a whole.

• The rate of fluid resuscitation should be based on clinical assessment, hematocrit, and BUN values.
Assessing Adequacy of Fluid Replacement

• Improvements in vital signs
  – HR <120 beats/min
  – MAP 65-85 mmHg
  – UOP >0.5-1 cc/kg/hr
  – Reduction in hematocrit (goal 35-44%) over 24 hours.

• One of the best indicators of survival is this reduction in hematocrit.

• The only way to achieve it is with HYDRATION, HYDRATION, and MORE HYDRATION.
Fluid resuscitation

• In the initial stages (within the first 12 to 24 hours) of acute pancreatitis, fluid replacement has been associated with reduction in morbidity and mortality.
Fluid resuscitation

- There is some evidence that fluid resuscitation with lactated Ringer’s solution may reduce the incidence of SIRS as compared with normal saline.
- Randomized trial of 40 patients
- Patients who received LR had lower CRP levels compared to NS (52 vs 104 mg/dL) and a significant reduction in SIRS after 24 hours (84% vs 0%).
Fluid resuscitation

• Inadequate hydration can lead to hypotension and acute tubular necrosis.
• Persistent hemoconcentration has been associated with development of necrotizing pancreatitis.
• Necrotizing pancreatitis results in vascular leak syndrome leading to increased third space fluid losses and worsening of pancreatic hypoperfusion.
Fluid resuscitation

• Important to limit fluid resuscitation mainly to the first 24 to 48 hours after the onset of the disease.

• Continued aggressive fluid resuscitation after 48 hours may not be advisable as overly-vigorous fluid resuscitation is associated with an increased need for intubation and increased risk of abdominal compartment syndrome.
Pain control

• Abdominal pain is the predominate symptom in patients with acute pancreatitis and should be treated with analgesics.
  – Uncontrolled pain can contribute to hemodynamic instability.
  – Attention to fluid resuscitation should be first priority in addressing abdominal pain, hypovolemia from vascular leak and hemoconcentration can cause ischemic pain and resultant lactic acidosis.
Pain Control

• Opioids are safe and effective
• Use IV opiates.
• Patient-controlled analgesic pumps are particularly useful.
• Hydromorphone and fentanyl
• Using more fentanyl, better safety profile
  – Bolus regimen ranges 20-50 mcg with 10 min lockout
Monitoring

• Closely monitored in first 24-48 hours
• Patients with organ failure will need ongoing monitoring.
• VS
• UOP, fluids titrated to UOP >0.5-1 cc/kg/hr
• Electrolytes monitored frequently in first 48-72 hours, especially with aggressive fluid resuscitation.
• Correct Calcium
• Serum glucose should be monitored hourly with severe pancreatitis, and hyperglycemia (blood glucose>180mg/dL) should be treated as it can increase risk of secondary pancreatic infections.
• Patients in ICU should be monitored for potential abdominal compartment syndrome with serial measures of urinary bladder pressures.
Nutrition

• Mild pancreatitis: IVF initially, and allow patients to resume oral diet within a week since recovery is usually rapid

• Moderate/Severe Pancreatitis: oral feeding may not be tolerated
  – due to nausea, development of fluid collections or gastric outlet obstruction
  – therefore patients may require enteral or parenteral feeding.
  – Transition to oral feedings should occur as soon as possible when patient’s local complications start improving.
Enteral vs. Parenteral Nutrition

• Enteral feeding better than parenteral in moderate to severe pancreatitis in patients who cannot tolerate oral feeding.

• Start enteral feeding early
  – Some guidelines state as early as 24-48 hours of disease onset.
  – Evidence to support this is lacking.
Enteral feeding

• Placement of feeding tube
• Does location matter?
• No

• Comparison between NG vs NJ (beyond the ligament of Trietz) should no difference in APACHE II scores, CRP levels, pain, or analgesic requirements.

• Although pulmonary complications noted higher in NG tube feeding.
Enteral feeding

- High protein, low fat, semi-elemental feeding formulas.
- Start 25 cc/hr and advance as tolerated to at least 30% of calculated daily requirement. (25 kcal/kg ideal body weight)
- Enteral feeding helps maintain the intestinal barrier and prevents bacterial translocation from the gut.
Enteral vs. Parenteral nutrition

• Also helps avoid complications associated with parenteral feeding: blood stream infections and complications of line placement.
• Parenteral nutrition should only be initiated in patients who do not tolerate enteral feeding
• Use of parenteral nutrition as an adjunct to enteral feeding may be harmful.
Parenteral nutrition

• Observational study
• 3000 mechanically ventilated critically ill adults
• Compared 60 day mortality in three groups
  – Enteral nutrition alone
  – Enteral nutrition plus early parenteral nutrition
  – Enteral nutrition plus late parenteral nutrition
• Enteral nutrition plus either early or late parenteral nutrition was associated with increased mortality as compared to enteral nutrition alone (35% vs 28%).
Antibiotics

• Up to 20% of patients with acute pancreatitis develop an extrapancreatic infection (bacteremia, pneumonia, and UTI).

• If infection is suspected, start antibiotics, however if work up is negative (cultures, radiology negative) discontinue antibiotics

• Prophylactic antibiotics are not recommended in patients with acute pancreatitis, regardless of type (interstitial or necrotizing) or disease severity (mild, moderate, or severe).
Management of Complications
Please consult GI/IR/Surgery/Renal

- Pancreatic pseudocysts
- Pancreatic necrosis
- Splenic vein thrombosis
- Pseudoaneurysm
- Abdominal compartment syndrome
- Gallstone pancreatitis
- Hypertriglycerideridemia
Summary

• Assess severity of pancreatitis
• Examine for signs of fluid losses and organ failure
• Measure APACHE II or SIRS score
• Routine CT ABD not recommended initially
• Hydrate aggressively
• Treat pain
• Consider early feeding to improve survival
• Obtain consultation for developing complications
Questions?

• Thank you, Sam Nourani