Management of Acute Pancreatitis

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Acute pancreatitis (AP) has an incidence of ~1/10,000 children per year and has been increasingly diagnosed in children in recent decades. A variety of etiologies including structural/anatomic, obstructive/ biliary, trauma, infections, toxins, systemic illness and genetic predispositions can result in AP.

Abdominal pain is the most common presenting feature followed by nausea, and vomiting. In infants/toddlers, symptoms may be subtle; therefore, the diagnosis requires a high level of suspicion.

The diagnosis of AP requires at least 2 of the following: (1) abdominal pain compatible with AP, (2) serum amylase and/or lipase values 3 times upper limits of normal, (3) imaging findings consistent with AP. The initial imaging modality of choice is an ultrasonogram. However, in cases where the diagnosis is uncertain a contrast enhanced CT (CECT) may be required to confirm AP and assess for local complications. If a CECT is required it should be delayed by at least 96 hours after symptom onset as early imaging may underestimate extent of disease.

On the basis of severity, AP is classified into mild (no organ dysfunction or complications), moderately severe (transient < 48 hours organ dysfunction or local/systemic complications) and severe AP (persistent organ failure > 48 hrs). Organ dysfunction includes cardiovascular, renal or respiratory dysfunction. A local complication includes pancreatic fluid collections or necrosis and systemic complication implies the exacerbation of a previously diagnosed co-morbid disease.

A focussed history should be taken to find out the etiology of AP. If there is no history of trauma, drug intake, infection or a systemic illness and there is no clue on imaging (gall stones, choledochal cyst etc) liver function test, triglycerides, and calcium level should be ordered. Genetic testing and more detailed imaging is reserved for cases of recurrent AP.

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The cornerstone of management of AP is fluid resuscitation, analgesia and monitoring for complications. Fluid resuscitation maintains adequate fluid status and prevents potential complications such as necrosis and organ failure. If there is evidence of hemodynamic compromise at presentation a bolus of 10-20 mL/kg is recommended. Thereafter, crystalloids (Ringers Lactate preferred over Normal Saline) should be given at 1.5-2 times the maintenance during the initial 24-48 hours. Adequate urine output (> 0.5-1 ml/kg/hour) is a marker of adequate fluid resuscitation. During this period the cardiovascular, respiratory and renal status should be closely monitored (at least every 4 hours).

Control of pain is an important therapeutic goal in the management of AP. NSAIDs/acetaminophens are the first line drugs. IV morphine/other opioids should be used if the pain is not responding to acetaminophen/NSAIDs

Contrary to popular belief, enteral nutrition (EN) should commenced as soon as feasible. Early enteral feeds (within 48-72 hours) with no specific diet restriction reduces length of hospital stay and risk of organ dysfunction. Nasogastric (NG) tube feeding can be considered for the patients not taking orally. Nasojejunal tube feeding is indicated only for the patients who are unable to tolerate oral/NG feeding. Parenteral nutrition should be considered in cases where EN is not possible for a prolonged period (longer than 5–7 days) such as in ileus or abdominal compartment syndrome.

There is no role for prophylactic antibiotics, probiotics, antioxidants and proton pump inhibitors. Fever is generally a part of a systemic inflammatory response syndrome and does not indicate an infection. Antibiotics are indicated only for documented infected necrosis (presence of gas within collections on imaging) or in patients with necrotizing pancreatitis not improving clinically without antibiotic use. The antibiotic of choice in such a situation is carbapenems, quinolones or metronidazole as they penetrate necrotic tissue.

Fortunately, majority of AP is mild and resolves in 3-4 days. Children need to be followed during their course of AP for complications including organ dysfunction & acute fluid collections and subsequently (>4weeks) for pseudocyst or walled-off necrosis (WON).

Severe AP, traumatic pancreatitis, cholangitis with pancreatitis and symptomatic pseudocyst or WON needs immediate

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referral to a specialist. ERCP is indicated in management of biliary AP related to choledocholithiasis and for pancreatic duct pathologies such as ductal stones or leaks. For the management of acute necrotic collections, interventions should be avoided and delayed, even for infected necrosis, as outcomes are superior with delayed (>4 weeks) approach. Where drainage is necessary, non-surgical approaches including endoscopic or percutaneous methods are preferrable over open drainage. Cholecystectomy can be safely performed before discharge in cases of mild uncomplicated acute biliary pancreatitis.

Prognosis of AP in children is good with low rate of mortality. Recurrence (15-35%) is reported, therefore periodic close follow up of all the patients should be carried out.

Further Reading:

1. Abu-El-Haija M, Kumar S, Szabo F, et al. NASPGHAN Pancreas Committee. Classification of Acute Pancreatitis in the Pediatric Population: Clinical Report From the NASPGHAN Pancreas Committee. *J Pediatr Gastroenterol Nutr*. 2017 Jun;64(6):984-990.
2. Abu-El-Haija M, Kumar S, Quiros JA, Balakrishnan K, et al. Management of Acute Pancreatitis in the Pediatric Population: A Clinical Report From the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition Pancreas Committee. *J Pediatr Gastroenterol Nutr*. 2018 Jan;66(1):159-176
3. Abu-El-Haija M, Uc A, Werlin SL, et al. Nutritional Considerations in Pediatric Pancreatitis: A Position Paper from the NASPGHAN Pancreas Committee and ESPGHAN Cystic Fibrosis/Pancreas Working Group. *J Pediatr Gastroenterol Nutr*. 2018 Jul;67(1): 131-143