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Commentary

A Guide to Necrotizing Enterocolitis

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DESCRIPTION

Necrotizing Enterocolitis (NEC) is the necrosis of intestinal tissue which is caused by anerobic bacteria, especially clostridia. It primarily affects premature infants or sick newborns. It is one of the serious gastrointestinal diseases of neonates, especially in preterm infants. NEC involves destruction of the bowel (intestine) or part of the bowel. Intestinal necrosis can involve all layers of the bowel. Most commonly involves the ileum and colon but can occur anywhere.

Symptoms include abdominal distention, blood in the stool, diarrhoea, feeding intolerance, lethargy, temperature instability, vomiting, apnea, episodes of bradycardias and desaturation, thrombocytopenia, peritonitis, etc.

Its incidence is 3 per 1000 live births and 30 per 1000 live births for low birth weight neonates. 90% occurs in premature babies. Incidence is 7% in newborns less than 1500 gms. Blacks are more likely to affect with disease compared to non-hispanic whites.

Causes

The exact cause of NEC is unknown. These premature infants have immature bowels, weakened by too little oxygen or blood flow. So, when feeding is started, the added stress of food moving through the intestine allows bacteria normally found in the intestine to invade and damage the wall of the intestinal tissues. The damage may affect only a short segment of the intestine or can progress quickly to involve a much larger portion.

Pathogenesis

A combination of risk factors predispose to NEC. Progression is due to stasis, bacterial overgrowth and vascular factors. Primary infectious agents such as bacteria, bacterial toxins, virus, fungus causes the release of inflammatory mediators such as macrophages, platelet activating factor, tumor necrosis factor, leukotriene C4 and interleukin 1 which leads to mucosal injury. Enteral feedings involves hypertonic formula or malabsorption of medication, endotoxin production, etc., also leads to mucosal injury of the intestine.

Diagnosis

NEC can be diagnosed by abdominal X-ray, stool for occult blood test, elevated white blood cell count in a Complete Blood Count (CBC), thrombocytopenia (low platelet count), and lactic acidosis. Prolonged prothrombin time and activated partial thromboplastin time is observed. Fibrinogen decreases and the fibrin split products increases.Differential diagnosis includes septicaemia, malrotation, volvulus, hirschsprungs disease, meningitis, urinary tract infections, etc.

Abdominal x-ray: Dilated bowel loops, thickened bowel wall, absence of intestinal gas, pneumatosis intestinalis can be observed.

Abdominal ultrasonography: The orientation of the superior mesenteric artery in relation to the superior mesenteric vein can provide information regarding the possibility of a malrotation with a subsequent volvulus.

Contrast enema: It is a definitive way to diagnose a distal obstruction. Always use a water-soluble contrast agent as there is risk of perforation. These findings are important for differential diagnosis of intestinal abnormalities, because distal obstructions may cause symptoms in the baby without fulminant systemic collapse.

Treatment

Mild non-specific systemic signs such as apnea, bradycardia, and temperature instability can be treated by NPO (nothing by mouth) with antibiotics for 3 days. Pneumatosis intestinalis treatment includes NPO and use of antibiotics of 7-10 days. Erythema or other discoloration, portal venous gas with or without ascites can be treated with antibiotics for 14 days. Prolonged parentral nutrition, prolonged use of broad spectrum antibiotics such as vancomycin, cefotaxime, clindamycin or metronidazole.

Surgical treatment: Resection of the affected portion of the bowel, which may be extensive. Initially, an ileostomy with a mucous fistula is typically performed, with reanastomosis performed later. Strictures may occur with or without a history of surgical intervention, which may require surgical treatment. NEC can be treated by probiotics such as *Lactobacillus reuteri* or *Lactobacillus rhamnosus*.

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Prevention

Prevention of asphyxia, antenatal steroids, breast milk feeds and also avoid hyperosmolar feeds. Arginine supplementation, enteral antibiotics, oral immunoglobulins, etc. can be taken for prevention of the necrotizing enterocolitis.