



Surgery

PERCUTANEOUS NEEDLE ASPIRATION IN MANAGEMENT OF PNEUMOPERITONEUM IN NEONATAL NEC PERFORATION; A PROSPECTIVE STUDY

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ABSTRACT **Introduction:** Necrotizing enterocolitis (NEC) is a common in neonatal age groups specially in premature and low birth weight neonates. Surgery is indicated when there is pneumoperitoneum or free gas in peritoneal cavity. Other modes of treatment include conservative observation or primary peritoneal drainage under local anaesthesia. This study was to evaluate primary peritoneal needle aspiration by 22fr IV canula, rather than primary peritoneal drain as a treatment of NEC.

Material and Methods: This prospective observational study started from Jan 2011 to Jan 2017 and including all patients of NEC having pneumoperitoneum with gas under diaphragm on X-ray abdomen.

Results: There were 30 patients of NEC. Seventeen patients responded to single peritoneal needle aspiration. Three patients needed repeat aspiration. Laparotomy was done in seven patients. Three patients expired due to severe sepsis. The mean duration of follow up was 3.43 months (range 2 to 8).

Conclusion: Percutaneous needle aspiration of peritoneal cavity is effective method for NEC who develops pneumoperitoneum without sepsis and ascitis.

KEYWORDS : Necrotising enterocolitis, Pneumoperitoneum, Neonates, Premature, Peritoneal aspiration

INTRODUCTION

Necrotising enterocolitis(NEC) is common in neonate patients especially premature and low birth weight babies following initiation of enteral feeding [1] and cause of significant morbidity and mortality [2,3]. NEC is classified according to Bell's staging a stage I (suspect), stage II (definite), or stage III- (advanced disease) [4]. Surgery is mainstay for treatment of the pneumoperitoneum.

Non-surgical management of this entity in form of peritoneal needle aspiration has been reported sporadically [5]. This prospective study was to evaluate percutaneous needle aspiration is effective method to manage pneumoperitoneum rather than peritoneal drainage and laprotomy.

MATERIALS AND METHODS

This study was conducted from January 2011 to January 2017. All patients of NEC having pneumoperitoneum on plain X-ray abdomen were included in this study (Fig-1). Patient were admitted directly or referred from the Paediatrician. All patients were put on intravenous (IV) antibiotics covering aerobic and anaerobic organisms. Clinical parameters such as pulse rate, respiratory rate, temperature, and capillary filling time (CFT) were monitored. Complete blood counts, renal function test, electrolytes, and C reactive protein (CRP) was done. Ultrasonographic evaluation of peritoneal cavity to see free fluid and particulate matter. An assessment of abdominal girth at umbilical level and abdominal wall erythema was noted, both before and after the peritoneal aspiration.

Under aseptic precautions, a 22 Fr IV cannula was inserted into the peritoneal cavity in the epigastric region about 1cm to the left of midline(Fig-2). The peritoneal cavity was deflated with the help of cannula and syringe, which was left at its placed for about 48 hours in a sterile gauze. Neonates kept nil by mouth and nasogastric tube. If there was bile or fecal content in canula, increase sepsis ,erythema of abdominal wall, recurrence of distension, laparotomy was performed within 24 hours.

A positive outcome was made on the basis of decreased abdominal girth, passing stool improvement in abdominal wall erythema, improved values of blood count, renal function tests, and CRP. Post needle aspiration X ray was done to evaluate outcome of pneumoperitoneum[Fig-3] The patients were allowed orally on 7th day after peritoneal aspiration. At that time, oral probiotics were also started. They were discharged after 14 days of IV antibiotics.

RESULTS

There were 30 patients of NEC with pneumoperitoneum over 6 year. Of these, thirteen were premature and seventeen were full term neonates. Male to female ratio was 3:1. The mean birth weight of the

patients was 2130 grams (range 1600 to 2800). At the time of presentation, the mean pulse rate and respiratory rate were 115.04 (range 110 to 130) and 56.70 (range 50 to 62) respectively. The mean total leukocyte count was 12044.23 (range 3500 to 18000).

At the time of peritoneal tapping, the mean abdominal girth was 36 cm (range 35 to 40). After abdominal decompression, it was 30.63 (range 28 to 32). Seventeen patients responded to single peritoneal tapping. Of these, twelve were full term and five was premature neonate. Three patients needed one more tapping. Of these, one was full term and remaining two were premature neonates. Laparotomy was required in remaining seven premature patients, which revealed extensive disease. Three patient, who underwent laparotomy, expired due to severe sepsis.

The mean duration of hospital stay was 13.04 days (range 12 to 15 days). At the time of discharge, all patients had normal vitals and serum biochemistry. The mean duration of follow up was 4.83 months (range 2 to 8). There was no problem in the follow up of all patients.

DISCUSSION

Radiological evidence of the free intraperitoneal air under the diaphragm is usually an indication of perforated intestine and requires an early surgical intervention. [6]Pneumoperitoneum can develop without an intestinal perforation as well[7]. Mild cases of NEC may be managed by medical management [3] which includes cessation of enteral feeding, empiric antibiotics, and supportive care [2]. The available surgical options include laparotomy or primary peritoneal drainage. Peritoneal drainage has been evaluated in various studies, some claiming it to be useful while others found it doubtful [8]. Two randomized control trials [9 10] have found that survival rates were not statistically different between peritoneal drainage and laparotomy groups.

The success of peritoneal tapping in this study was about 83%. The technique of peritoneal needle aspiration differs from that of peritoneal drainage, which involves penrose drain placement under vision. Peritoneal needle aspiration is a less invasive method, whereas peritoneal drainage involves opening of the peritoneal cavity and placement of the drain. Pneumoperitoneum not always indication of surgery we think pin point perforation following NEC becomes sealed when kept nil by mouth and appropriate antibiotics. When neonate kept nil by mouth inflammation of bowel segment subsides that leads to faster healing of perforated site. As per history in cow milk is prone in favour of NEC perforation.

CONCLUSION

To conclude, conservative management of pneumoperitoneum by percutaneous needle aspiration in NEC appears to be a conservative

management option under strict monitoring. Long term evaluation and large sample size required.



Fig-1 pneumoperitoneum



Fig-2 Percutaneous needle aspiration of peritoneal cavity by IV canula



Fig-3 Resolved pneumoperitoneum

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