Spontaneous Intestinal Perforation (SIP) in Term Newborn, its Possible Association with Toxoplasma Gondii Infection A Case Report

Pius S 1*, Bello M 1, Ibrahim BA 1, Dogo H 2, Ngajiwa U 2, Wabada S 2 and Ambe JP 1
1 Department of Paediatrics, University of Maiduguri Teaching Hospital, Maiduguri, Nigeria
2 Department of Surgery, University of Maiduguri Teaching Hospital, Maiduguri, Nigeria

Introduction

Spontaneous intestinal perforation (SIP) of newborn also referred to as isolated/focal/localized perforation of a newborn is a one or two isolated intestinal perforation that is typically found in the terminal ileum of the affected preterm very low birth weight newborn [1,2]. It was once thought to be part of the clinical spectrum of necrotizing enterocolitis (NEC), however was found to be a distinct clinical entity different in both clinical and histologic presentation from NEC [3,4]. Spontaneous intestinal perforation occurs primarily in very low birth weight and extreme low birth weight premature newborns with incidence of 2-3% in VLBW and about 5% in ELBW, with an overall incidence of 3.9-7.4% [5]. The disease is reported to be rare in term newborns with incidence in less than 1% [3]. It has no known aetiology, the major risk factor implicated is prematurity, others includes maternal chorioamnionitis, post natal steroids, use of indomethacin in Patent ductus arteriosus (PDA) and of recent, others have suggested infection by T. gondii. The main aim of the case report is to highlight the fact that spontaneous intestinal perforation even though rare do occur in term neonate and to remind the clinician to be on watch out for (SIP) because it is often misdiagnosed. It often mimick varied conditions in newborn including neonatal sepsis presenting as ileus. The common presentation is abdominal distension which usually corroborated by abdominal x-ray which shows pneumoperitoneum as evidence of intestinal perforation, usually following commencement of feed in a sick usually preterm very low birth weight newborn. The main stay of treatment in addition to broad spectrum antibiotics is surgery by laparotomy and primary closure of the perforation, even though others have suggested placement of primary peritoneal drainage (PPD).

Keywords: Spontaneous, Intestinal perforation, Toxoplasma gondii pathogen

Case Report

A 14 days old neonate who was admitted at 12hrs of life from obstetric ward with complaints of fast/difficulty in breathing 6hrs duration, the symptom started at 6hrs after birth associated with grunting. There was use of accessory group of muscles of respiration, however no crepitation, no cyanosis and no apnoeic spell or seizures observed. There was no history of fever in the child. He had passed meconium twice before being admitted into Special Care Baby Unit (SCBU).

Mother was on admission for one week before delivery as she was being managed for both diabetic mellitus and hypertension in pregnancy. She had no history of fever, urinary tract infections or any febrile illness peripartum. Pregnancy was achieved by assisted reproductive technology by way of in-vitro fertilization (IVF) and embryo transfer technology (ETT), was supervised in the same health facility. She had bad obstetric history; she had three first trimester abortion and foetal wastage.
Delivery was by elective Caesarean section indicated by the above maternal condition. She had Apgar score of 6 and 8 at 1 and 5 minutes respectively. She was yet to commence breast feeding. Mother is 35yrs old graduate and banker, while the father 42yrs graduate working with local government. On admission in SCBU, she was kept warm under radiant warmer and placed on oxygen via nasal prong in addition to minimal suctioning among other resuscitative measures.

Examination finding as at admission revealed an ill child, with subnormal temperature of 36.2 °C, pink but with dusky extremities, no dysmorphic features identified, he weighed 3.5kg, with the length of 49cm and head circumference was 36cm.

She was dyspnoeic and tachypnoeic with respiratory rate 78 CPm and breath sounds were vesicular. Heart rate was 140BPM, apex beat was in the 4th left intercostal space mid clavicular line, heart sounds were S1 and S2 only.

Abdomen was flat and soft, umbilical stump was clamped and clean. Bowel sound was heard and normoactive with normally sited anus. She had mature normal female external genitalia. Patient was conscious and alert but restless, anterior fontanelle was patent and normotensive. She had fair sucking reflex, good palmar grasp and Moro reflex was complete with normal tone. A working diagnosis of presumed sepsis to rule out transient tachypnoea of the newborn was made. Investigation done: Blood culture was negative but such could not rule out the possibility of infection with Toxoplasma gondii organism, as it involves biopsy of bowel mucosal tissues affected and was not done as well due to logistic reasons. CBC; PCV=45%, WBC=5.8 x 10⁹/L, there was thrombocytopenia with Platelets of 66.0 x 10⁹/L, N=50%, L=47%, E=03%. She was identified to be hypoglycaemic with RBS of 0.6mmol/L at admission, at 2hrs = 3.0mmol/L at 6hrs=3.7mmol/L at 12hrs= 3.8mmol/L and at 24hrs into admission 4.6mmol/L. Na+ =142mmol/L, K+ =6mmol/L, Cl− =97mmol/L, HCO₃− =22mmol/L, Urea = 5.8mmol/L. Stool culture was negative.

Patient was started on parenteral antibiotics comprising of Cefuroxime and Gentamycin. The hypoglycaemia was treated with bolus of 10%dextrose at 200mg/kg start and continued on maintenance fluid 10% dextrose fluid at 60mls/kg. She was also continued on oxygen via nasal prong. On the second day of admission (36hrs of life), respiratory difficulty had subsided, temperature had normalized and serum glucose was also within normal limits.

Following further review on the third day of admission (60hrs of life) patient had stabilized, sucking reflex was strong and mother had established lactation, so patient was commenced on direct breast feeding. After observing the neonate latching and sucking well from breast, intravenous dextrose containing fluid was discontinued, however parenteral antibiotics was continued.

On the fourth day of admission (84hrs of life) and 24hrs after commencement of breast feeding, she developed abdominal distension and had not passed stool during this period. There was no history of vomiting and no history suggestive of feed aspiration. A working diagnosis of presumed sepsis presenting as necrotizing enterocolitis was made. Investigation including plain abdominal X-rays, erect and supine film which shows pneumoperitoneum indicating intestinal perforation, see (Figure 1) above.

Breast feeding was suspended; nasogastric tube 8FG was passed to decompress the abdomen. She was reverted back to Dextrose containing intravenous fluid, intravenous metronidazole was added as third antibiotic. Paediatric surgical team was consulted and following review the baby had an exploratory laparotomy which revealed an area of inflammation with perforation on the mesenteric aspects of ileal segment at 30cm from ileocecal junction which was closed primarily by suturing see (Figure 2) above.

Patient had continued on the three antibiotics and on third post-operative day, baby had passed stool twice and bowel movement was strong, so was recommenced on direct breast feeding which the patient tolerated well. Patient had recovered well with no complication. Intramuscular Gentamycin was discontinued after 8days course while Cefuroxime and metronidazole was discontinued after 14days course and patient was discharged home. He was seen on follow up in the unit and the child was doing well, see (Figures 3A and 3B) below.

**Discussion**

Spontaneous intestinal perforation (SIP) which is primarily a disease of preterm newborn, though it does also occur in the term infant in less than 1% of cases. Risk factors such as the use of indomethacin for treatment of patent ductus arteriosus (PDA) and postnatal use of glucocorticoids for prematurity and maternal chorioamnionitis has well been documented in preterm newborn, while severe perinatal asphyxia was observed to be...
Citation: Pius S, Bello M, Ibrahim BA, et al. (2017). Spontaneous Intestinal Perforation (SIP) in Term Newborn, its Possible Association with Toxoplasma Gondii Infection a Case Report

The single most important risk factor in term newborn infant [8-12]. In an observation by Prandota, et al. [13], that latent chronic infection with T. gondii has been implicated in the development of type 1 and 2 diabetic mellitus, and the mother of this index patient has type 2 DM, we hypothesize that this mother may be suffering from this disease since we did not go after it, we cannot discard possibility of T. gondii infection. The pathophysiologic mechanism of SIP proposed in affected preterm VLBW and ELBW has been an exposure to postnatal steroid alone or in combination with indomethacin treatment which induces ileal sub-mucosal thinning and mucosal hyperplasia making the ileal wall vulnerable to focal necrosis and perforation once bowel motility resumes [14], as well as perturbations in nitric oxide [NO] metabolism or circulatory stress response due to reduced mesenteric blood flow as it occur in perinatal asphyxia in term newborns [14,15]. Also James, et al. [16] suggested that in the presence of infection with T. gondii, it induces strong pro-inflammatory mediators like T₃,1 cell response which induces nitric oxide overproduction as well as generation of reactive free oxygen spices/radicals and reactive nitrogen (radical) intermediates that further accentuate the mucosal destruction and several other gastrointestinal abnormalities, Prandota, et al. [13] To further buttress the possibility of infection by Toxoplasma gondii in the causation of SIP, Bernardin, et al. [17] working on Cats also demonstrated the presence of relationship between the the parasite and the diagnosis of spontaneous gastrointestinal perforation. Feline are the main source of this parasite T. gondii to human Furtado, et al [18] and since it is being kept as pet at home and most often at time they are not cared for by Veterinary health personnel, they continue to harbour the infection and transmit it to the human or even in undercooked meat unchecked.

The clinical presentation of SIP is typically that of an extremely preterm low birth weight infant in the first week of life with sudden clinical deterioration, characterized by abdominal distension, bluish discoloration of the abdomen after the infant has begun to feed [14-19]. Also abdominal imaging usually demonstrate pneumoperitoneum which was the case in the index baby, but there is no evidence of pneumatosis intestinalis or portal venous gas which are present in NEC, may also demonstrate gasless abdomen in some patients with SIP [20]. The management modality which mainly involve resting of the bowel by stopping all forms of enteral route of feed or any other medications, nasogastric tube for decompression of the abdomen and laparotomy with primary closure of the perforation site or resection and anastomoses [2]. Other experts have employed the use of placement of primary peritoneal drainage (PPD) and has been successful in small proportion of such a group of patients [1,21].

Conclusion

Spontaneous intestinal perforation (SIP) is primarily a problem commonly affecting preterm very low birth weight newborn. The common predisposing risk factors such neonatal sepsis, hype reactivity of the immature gut mucous membrane and commencement of enteral feeding route triggers this condition, though SIP is rare (<1%) in the term newborn, it does occur. High index of suspicion on the side of the neonatologist and early diagnosis by use of appropriate diagnostic tools and prompt surgical intervention can improve the prognosis for the better.

Acknowledgement

The authors are particularly grateful for the expertise of the medical and nursing team of the Special Care Baby Unit and the surgical team of the Department of Paediatric Surgery of University of Maiduguri Teaching Hospital for their prompt intervention.

References


**Copyright:** © 2017 Pius S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.