

LETTER TO THE EDITOR

Milk Curd Syndrome in a Neonate Fed with Goat's Milk

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DEAR SIR

Milk curd syndrome or inspissated milk syndrome or milk plug syndrome is a rare cause of intestinal obstruction in neonates [1]. This entity was more commonly encountered before 1980's, when formula feeds were manufactured by just drying of cow's milk. Milk curd syndrome after initiation of feeding with unmodified animal milk is extremely rare. We report milk curd syndrome in a neonate who presented with signs of small intestinal obstruction after being fed with goat's milk.

An 8-day-old baby, weighing 1800 grams, presented with episodes of bilious vomiting and abdominal distension along with fever. Baby was passing meconium normally during first 2 days of life but later passed few pellet like small, firm, white coloured stools. The neonate was first born male child (birth weight-2500 grams), born full term by vaginal delivery to a 21-year-old mother (Gravida1, Para1). Further history revealed the baby was fed with goat's milk. On examination child was vitally stable; abdomen was moderately distended and bowel loops were visible. Perineal examination was normal and rectum was empty. Laboratory investigations were normal except serum urea (160 mg/dl) and serum creatinine (1.0 mg/dl). Abdominal radiographs (Fig.1) suggested dilated proximal small bowel loops, paucity of air in the lower abdomen and pelvis with few pellet like soft tissue shadows in right ileac fossa. Normal saline enemas were given but did not settle the condition. Exploration revealed small bowel dilatation up to proximal ileum with presence of very dense, inspissated, sticky and white coloured intraluminal material throughout the distal ileum

and also colon (Fig.1). The contents were milked distally in the large intestines and finally out of the rectum. The contents were curdled milk. The patient did well postoperatively, in spite of the initial ileus; an oral feed were gradually initiated and finally was discharged on 9th post-operative day. Baby is under follow-up.



Figure 1: Abdominal radiograph (left) showing dilated small bowel loops with few air-fluid levels (white arrows); paucity of bowel gas in the central and right lower quadrant with few pellet like soft tissue shadows in right ileac fossa (yellow arrows). Intraoperative photograph (right) showing inspissated milk curds in the distal ileum.

The milk curd syndrome was first described by Cook et al in 1969 [2]. It has been described in neonates who are fed with high caloric fortified expressed breast milk, [1] concentrated formula feeding, [3,4] and fortified cow's milk with high fat content. The factors implicated are prematurity, low birth weight, early use of concentrated formula feeds, use of additives like calcium, medium-chain triglycerides, premature gastrointestinal physiology, cow's milk

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protein intolerance and use of reconstituted powdered cows' milk with full-cream with high calcium leading to defective absorption of butter fat with formation of a calcium soap in the gut lumen [3-6]. Differential absorption of the water and solid content of the milk leaving a plastic-like or gritty bolus is the presumptive mechanism for this entity.

The greater solute load of cows' milk (which is also seen in goat's milk) could also lead to relatively early 'drying out' of the intestinal content. [2] Unmodified goat's milk contains high protein (3 times the human milk) and minerals like calcium and phosphorus and a low carbohydrate and folate content [6].

Complications like perforation in stomach, terminal ileum, appendix and Meckel's diverticulum are seen with delay in diagnosis. Rarely, necrotising enterocolitis due to ischaemia of the bowel has been reported [3]. The differential diagnoses are meconium ileus and total colonic aganglionosis. Radiological findings on abdominal X-ray, in addition to multiple dilated bowel loops and air-fluid levels are multiple intraluminal opalescent masses surrounded by a halo of air or containing bubbles of gas with ground glass appearance in the right ileac fossa [2]. Hyperechoic masses may be seen on ultrasound.

Non-operative treatment consists of gastrografin enemas, which may be both diagnostic and therapeutic. Laparotomy is required when conservative management fails [1]. Inspissated bolus in most of the cases is seen in the terminal ileum, including the index case. It may also be seen in mid-

ileum and may also extend into the colon. The bolus should be broken up through the bowel wall and milked through the ileocaecal valve into the colon. It can be assisted by intraluminal injection of isotonic saline [3]. Additional measures like enterotomy and removal of the bolus and resection with or without diverting ileostomy have been performed. Molecular genetics studies for cystic fibrosis mutations were not done in our case due to resource limitations.

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