

Case Report

Allergic Colitis Presenting in the First Day of Life: Report of Three Cases

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Allergic colitis due to cow's milk or soy protein in commercially prepared infant formula or to ingestion of breast-milk of mothers who are drinking cow's milk is the major type of colitis occurring in the first year of life (1). Most children with allergic colitis show symptoms within the first few months of life (2), usually by 4 weeks of age (3). The youngest case reported was in a 2-day-old infant. The authors postulated that sensitization to the antigen occurred prenatally (4). We describe three full-term neonates in whom hematochezia due to allergic colitis developed within 28 hours of life.

CASE REPORTS

Case 1

A full-term girl (birth weight 3.8 kg; Apgar scores [at 1 and 5 minutes] 8¹ and 9⁵) was born by spontaneous vaginal delivery to a 23-year-old woman with well-controlled insulin-dependent diabetes mellitus. Membranes ruptured less than 24 hours before delivery. Mild hypoglycemia developed in the infant shortly after birth, which was treated with intravenous dextrose. A commercial cow's milk protein-based formula was initiated at 1 hour of age. At 28 hours of life, the infant began to have grossly bloody stools. Examination was remarkable for a few petechiae over the upper half of the body and a grade 2/6 systolic murmur at the left lower sternal border. Feedings were discontinued. Intravenous antibiotics were initiated empirically and continued until blood and stool cultures for *Salmonella*, *Shigella*, *Campylobacter*,

and *Yersina* were reported negative. The family history was remarkable for atopy but no bleeding diathesis.

Laboratory results included a total white cell count of 17,800/mm³ with 4% eosinophils, hematocrit of 47%, platelets of 179,000/mm³; normal blood chemistry, liver function test, and coagulation screening results; serum immunoglobulin (Ig)E less than 1.0 U/mL; a nonspecific paucity of bowel gas pattern on flat abdominal radiograph; and sterile blood and stool cultures. A limited colonoscopy on day 5 of life demonstrated a very friable, edematous colonic mucosa. Biopsies of descending and rectosigmoid colon demonstrated edematous lamina propria infiltrated by clusters of eosinophils with focal degranulation, and intraepithelial eosinophils in surface and glandular epithelium. The infant remained clinically stable during the entire hospital stay. However, the bloody stools persisted for 5 days. Casein hydrolysate formula was gradually introduced on day 6 of life without recurrence of bloody stools. The infant was discharged home on day 8 of life, weighing 3.8 kg. She continued to gain weight adequately while consuming hypoallergenic formula and weighed 8.4 kg (25th percentile) at 1 year of age.

Case 2

A full-term African-American boy (birth weight 3.3 kg; Apgar scores 8¹ and 9⁵) was born by spontaneous vaginal delivery to a 36-year-old woman. Labor and delivery were complicated by maternal group B *Streptococcus* colonization, and rupture of membranes occurred 6 hours before delivery. The infant received a commercial cow's milk protein-based formula 50 minutes after birth. At 25 hours of life, the infant had two episodes of passing frank blood per rectum. Clinical examination was unremarkable. Intravenous antibiotics were prescribed empirically until all cultures were reported negative. Laboratory results showed a total white cell count of

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13,100/mm³ with no eosinophils, hematocrit was 60%, with platelets of 129,000/mm³; normal blood chemistries and coagulation profile; sterile stool (*Salmonella*, *Shigella*, *Campylobacter*, and *Yersinia*) and blood cultures; and nonspecific gas pattern with no signs of obstruction or pneumatosis on abdominal radiograph. A limited colonoscopy performed on day 4 of life revealed frankly bloody, friable colonic mucosa with ulceration in the rectum. Histopathology of rectosigmoid biopsy specimens showed recent focal hemorrhage with diffuse eosinophilic infiltration of the lamina propria (>60 eosinophils per 10 high-power microscopic fields), intraepithelial eosinophils, and rare neutrophils.

The infant remained well and gradually began feeding again on day 7 of life consuming casein hydrolysate formula. Bloody stools ceased within 48 hours. He was discharged home on day 8 of life with a weight of 3.3 kg. At 17 months of age, he was healthy, was consuming an unrestricted diet, and weighed 14.1 kg (>95th percentile for age).

Case 3

A full-term boy (birth weight 4 kg; Apgar scores 9¹ and 9⁵) was born by spontaneous vaginal delivery to a 17-year-old mother who had had good prenatal care. The course of labor and delivery was unremarkable. Rupture of membranes occurred 5.5 hours before delivery.

The infant was initially breast fed 40 minutes after birth and then supplemented with a commercial cow's milk protein-based formula. Rectal bleeding developed at 27 hours of age when a small amount of stool mixed with mucus and a moderate amount of blood were found in his diaper. Physical examination was unremarkable. Family history was positive for atopy. Laboratory results showed a total white count of 18,000/mm³ with 4% eosinophils, hematocrit of 50%, platelets of 266,000/mm³; normal blood chemistry, liver function test results, and coagulation profile; serum IgE less than 2 U/mL. Stool was positive for leukocytes, but there was no growth on cultures (*Salmonella*, *Shigella*, *Campylobacter*, and *Yersinia*). An abdominal radiograph was normal. A limited colonoscopy revealed an erythematous friable mucosa. Histopathology of rectosigmoid biopsy specimens demonstrated increased numbers of eosinophils with degranulation in the lamina propria, intraepithelial eosinophils, edema, and hemorrhage. Feedings were begun again with a casein hydrolysate formula. Frank blood in the stools ceased. On follow-up at 4.5 months, the infant was doing well consuming casein hydrolysate formula and weighed 6.1 kg (25th percentile for age).

DISCUSSION

These three infants had rectal bleeding that occurred shortly after birth (Table 1). Although this is not uncommon

TABLE 1. Summary of clinical history of the three cases

Demographics	Case 1	Case 2	Case 3
Birth weight (kg)	3.8	3.3	4.0
Race	AA	AA	AA
Gender	Female	Male	Male
Maternal diabetes mellitus	Yes	Yes	No
Rupture of membranes (hr)	<24	6	<6
Apgar scores at 1 and 5 minutes	8 ¹ 9 ⁵	8 ¹ 9 ⁵	9 ¹ 9 ⁵
Diet before symptoms	CMPF	CMPF	MBM/CMPF
Age at first feeding (hr)	1	0.8	0.7
Onset of hematochezia (hr)	28	25	27
Family history of atopy	+	Unknown	+
Serum IgE (IU/mL)	<1.0	—	<2.0
Absolute eosinophil count (mm ³)	712	0	720
Feed after diagnosis	CHF	CHF	CHF
Postdiagnosis medication	none	none	None
Length of follow-up (mo)	12	21	4

AA, African-American; CMPF, cow's milk protein formula; MBM, maternal breast milk; CHF, casein hydrolysate formula; Ig, immunoglobulin.

mon in ill, premature infants in the neonatal intensive care unit, these infants were full-term and otherwise healthy. The bleeding occurred in all of them after oral exposure to an antigen, cow's milk protein, suggesting the possibility of allergic colitis, despite onset of symptoms within hours of birth. However, because other causes of rectal bleeding can occur in a similar manner and eosinophilic allergic colitis is usually not considered in the differential diagnosis of rectal bleeding in the first day of life, other causes of hematochezia had to be considered. The differential diagnosis of rectal bleeding in the newborn period includes benign conditions, such as an anal fissure or swallowed maternal blood. It also can be caused by potentially life-threatening disorders such as necrotizing enterocolitis, volvulus, gastroenteritis, sepsis, intussusception, and colitis complicating Hirschsprung's disease (5). The diagnosis of allergic colitis relies not only on the exclusion of other causes of hematochezia, but also on the characteristic pathologic features observed in proctosigmoidoscopy and diagnostic rectal biopsy (6–8). In addition, an appropriate response to dietary elimination and rechallenge must be demonstrated (9).

The proctosigmoidoscopic and histologic findings of all three newborns were similar and fulfilled the well-established criteria for allergic colitis. The findings included infiltration of the lamina propria with increased numbers of eosinophils (≥ 60 per 10 high-power microscopic fields) and intraepithelial eosinophils in glandular and surface epithelium in the presence of otherwise intact mucosa. Because these patients had significant bleeding on initial examination, rechallenging with cow's milk protein formula was thought to be contraindicated, and therefore was not undertaken.

All three infants in our report were fed cow's milk protein-based formula and developed rectal bleeding soon after birth, associated with characteristic features of

allergic colitis on proctosigmoidoscopy and biopsy. Presumably, these infants were sensitized to cow's milk protein in utero, and the postnatal feeding of these infants with a cow's milk protein-based formula was a challenge to these already-sensitized infants. By substituting a casein hydrolysate formula for these infants, the inciting antigen (cow's milk protein) was removed, leading to resolution of symptoms.

The early development of rectal bleeding in these infants suggests in utero food-antigen sensitization. It is postulated that allergic colitis is caused by passage of immunoglobulin (Ig)G antibodies against particular food antigens across the placenta as described in the guinea pig model (10). The role of in utero sensitization has been mainly described in relation to skin manifestations (11–14). Many reports in the literature find an association between eczema and food allergies (15,16). One fourth of children between 2 and 24 months of age with eczema have gastrointestinal symptoms (vomiting and loose stools) (15). It is possible that a similar mechanism occurs in gastrointestinal manifestations of food allergy, leading to in utero sensitization and gastrointestinal symptoms occurring immediately after birth, as was also postulated by Wilson et al. (17) and Sherman and Cox (4).

Allergic colitis usually resolves after infancy, and most infants can tolerate milk by 1.5 to 2 years of age (17,18). All three infants in our report thrived well on casein hydrolysate formula, and patient 2 has been successfully weaned to and is thriving on an unrestricted diet at 17 months of age.

SUMMARY

Allergic colitis can occur within hours of birth and should be considered in the differential diagnosis of any newborn in whom hematochezia develops. This diagnosis should be considered after excluding infectious and anatomic disorders common to this age group. The diagnosis is supported by the healthy appearance of affected infants and specific proctosigmoidoscopic and histopathologic findings. Infants with allergic colitis usually respond to withdrawal of the offending antigen, by the use of hydrolyzed cow's milk protein formula or more elemental formulas, or if the infant has been breast fed, by the strict removal of the offending antigen from the breast-feeding mother's diet.

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