

Pediatric Allergic Proctocolitis

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Pediatric allergic proctocolitis is considered an IgE-mediated allergic reaction to dietary proteins; most commonly is Cow's milk protein, which represents about 50-65% of the cases. It's a frequent, significant cause of infant colitis. This article explains the main clinic-patho-physiological aspects of the disease.



Definition

Pediatric allergic proctocolitis (PAP) is a non-IgE mediated food allergic disorder, where [cell-mediated immunity](#) plays the key role. It is one cause of **hematochezia** in infancy, which occurs between the ages of 1 day to 3 months. It is considered a frequent and significant cause of colitis in infants and usually resolves by the age of 1 year.

Non-IgE cell-mediated food allergy disorder types

Non-IgE, cell-mediated food allergic disorders are comprised of different disorders, namely:

1. Food protein-induced enterocolitis syndrome (FPIES)
2. Food protein-induced enteropathy
3. Heiner's syndrome (pulmonary hemosiderosis)
4. Celiac disease
5. Cow's milk (CM) protein-induced iron deficiency anemia

Food protein-induced enterocolitis syndrome (FPIES)

Seen in infants from day 1 to about 12 months of age, FPIES involves severe vomiting,

explosive **diarrhea**, severe bloody stools, and acute severe **edema**. Incriminating food proteins include CM, soy, rice, fish, pea, turkey, and barley. **CM and soy** account for about 40% of cases.

Significant positive personal and family history for atopies and allergies is often documented. The child is often sick; about 15% go into **shock**, and a significant subset present with **moderate failure to thrive and anemia**. Methemoglobinemia, academia, and acute hypoalbuminemia mark FPIES.

The standard evaluation for IgE-mediated allergic disorders includes various tests, such as the food prick skin test, peripheral blood eosinophil titer, total IgE, and serum food allergen IgE levels are normal.

Treatment typically begins by eliminating the trigger protein from the diet. Casein hydrolysate is often administered. Symptoms resolve within 3-10 days after eliminating the culprit molecule. CM allergies naturally regress by about 2 years of age.

Food protein-induced enteropathy

Enteropathy presents in children up to 2 years of age. The most commonly implicated protein molecules are CM and soy. **Breast milk** is the source of these culprit compounds. The clinical picture involves moderate diarrhea, intermittent vomiting, and moderate edema. Rectal bleeding may occur on rare occasions. **Moderate hypoalbuminemia** is the only laboratory marker. Allergy evaluation is remarkable for being normal. The treatment involves eliminating the culprit protein.

Celiac disease

With an allergic reaction to wheat protein, celiac disease etiopathogenesis is well documented in the literature.

Heiner's syndrome (pulmonary hemosiderosis)

This is a rare disorder, caused by hypersensitivity to CM, which is characterized by pulmonary hemosiderosis, digestive bleeding, anemia, and failure to thrive. It improves after eliminating CM from the diet.

Cow's milk (CM) protein-induced iron deficiency anemia

This presents until the age of about 20 months. **CM-based formula feeds** lead to this entity. Symptoms are minimal, and laboratory and allergic evaluation results are usually normal. Treatment includes eliminating whole CM protein from the diet and introducing CM-based formulas. Most children are in remission by 3 years of age.

Epidemiology of Pediatric Allergic Proctocolitis

PAP is estimated to be responsible for about **15-60% of rectal bleeding cases in infants**. In most cases, infants appear to be well apart from blood in the stool. Associated **eczema** is seen in about 22% of patients, while up to 25% have **a positive family history of allergies**.

Pathogenesis and Clinical Features of Pediatric

Allergic Proctocolitis

Maternal ingestion of the food allergen, commonly CM, subsequently transferred in babies through breast milk as an immunologically prone form. Formula-fed infants demonstrate an allergy to CM and soy proteins.

Prominent eosinophilic aggregations are found via intestinal mucosal biopsy in PAP. Degradation of eosinophils around the nerves leads to a release of eosinophilic mediators.

These immunomodulatory molecules cause a subsequent induction of **mast cell degranulation, vagal muscarinic M2 receptor dysregulation, smooth muscle contraction**, and **stimulation of chloride secretion** from the colonic epithelium. They also culminate in **gastric dysmotility**. These mechanisms are thought to contribute to **mucosal eosinophilic infiltration** in PAP pathogenesis.

Signs and symptoms of PAP are summarized as follows:

Symptom/Sign	Explanation
Intermittent vomiting	Rare
Intermittent blood-streaked stools	Most frequent complaint
Diarrhea	Mild
Pain on defecation	Occasional
Flatulence	Occasional
Occasional abdominal colic	Mild
Failure to thrive	No
Family history of allergies	In about 25% of patients

Diagnosis and Differential Diagnosis of Pediatric Allergic Proctocolitis

Diagnosis is based on the following salient features of PAP:

- History of blood-streaked stools.
- Relatively preserved child.
- Exclusion of other infections and etiologies behind rectal bleeding.
- Response to an elimination diet serves as a concluding proof. It leads to resolution of symptoms within 3 to 4 days.

There are various **ancillary tests** that one may use to supplement the clinical diagnosis and rule out other closely associated differentials. A summary of the same is presented below:

Laboratory tests	<ul style="list-style-type: none"> • Hypobuminea: infrequent <ul style="list-style-type: none"> • Anemia: mild • Methemoglobinemia: absent <ul style="list-style-type: none"> • Acidemia: occasional
Allergy evaluation	<ul style="list-style-type: none"> • Food prick skin test: negative • Serum food allergen IgE: negative <ul style="list-style-type: none"> • Total IgE: normal or elevated • Peripheral blood eosinophilia: occasional
Intestinal mucosa biopsy findings	Focal colitis, with mild linear mucosal erosions, without evidence of villous injury is seen. Eosinophilic infiltration is appreciated in abundance.
Fecal mucus smear	Increased polymorphonuclear neutrophils.
Endoscopy	No anatomic abnormalities appreciated. Lymphoid nodular hyperplasia and focal erythema are commonly documented.
Stool culture	Negative

Differential diagnosis of rectal bleeding

Rectal bleeding is the most prominent symptom of PAP. Consequently, one needs to be wary of other crucial etiologies behind rectal bleeding. The same can be segregated by the degree of rectal bleeding as follows:

Extent of rectal bleeding	Implicit diagnosis
Significant	<ul style="list-style-type: none">• Sepsis• Food protein-induced enterocolitis syndrome (FPIES)• Necrotizing enterocolitis<ul style="list-style-type: none">• Volvulus• Hirschsprung's disease
Intermediate to minimal rectal bleeding	<ul style="list-style-type: none">• Gastrointestinal infection (Campylobacter, Shigella, Salmonella, parasites) causing dysentery• Vitamin K deficiency• Perianal dermatitis• Coagulation disorders<ul style="list-style-type: none">• Anal fissure

Treatment and Prognosis of Pediatric Allergic Proctocolitis

Pediatric allergic proctocolitis is deceptively alarming and seemingly an annihilating disease of infants with rectal bleeding. It is a benign, transient disease and has a very manageable course.

Dietary restriction and **elimination of the offending protein molecule** from the maternal diet for [breastfeeding](#) mothers is a definitive, curative, and complete treatment for PAP. Lake proposed discontinuing breast milk and using casein hydrolysate formula for about 72 hours or until resolution of bleeding, whichever occurs earlier.

Soy proteins are best avoided as there is a cross-reaction to soy in about 40% of children with allergy to CM. Few children require amino acid-based formulas.

Once remission sets in, food introduction is done at home in a progressive, increasingly graded manner. Full feeds are typically reached at the end of two weeks.

The long-term prognosis is excellent. Almost one-fifth of babies demonstrate spontaneous regression of rectal bleeding. Many develop a tolerance to the offending protein by one year of age. These children are essentially normal, with no increased predisposition to future grave gastrointestinal diseases.

Prognosis

Prognosis is considered excellent; most infants can tolerate soy products and CM by the age of 1 year.

Summary

Pediatric allergic proctocolitis belongs to the family of **cell-mediated non-IgE mediated food allergic disorders**, which are being increasingly appreciated in recent times. Cow protein allergy, soy protein allergy, and allergy to unidentified potential breast milk triggers in breast milk-fed babies are inciting factors.

PAP is an important cause of rectal bleeding and the frequent etiology behind colitis in

infants below one year of age.

Although seemingly alarming, with streaks of blood accompanying stools, PAP has a benign and transient course.

The child is well preserved and has no signs of failure to thrive. Food allergy tests are negative. Diagnosis is based on clinical acumen, often supplemented by tests meant to rule out close differentials.

Treatment consists of eliminating the offending molecule from the maternal diet for breastfed infants. Casein hydrolysate, hypoallergenic formula feeds, and amino acid-based formulas may also be used. Reintroduction of foods is typically done in a progressive, graded manner, reaching full feeds at about 2 weeks.

Excellent prognoses are implied for these patients, with many undergoing spontaneous resolution. Long-term increased predisposition to chronic, inflammatory gastrointestinal disorders is a myth.

References

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