Pediatric Oncall Journal
Volume : 22, Issue 3:121-124
DOI: https://doi.org/10.7199/ped.oncall.2025.83

PEDIATRIC ONCALL
CHILD HEALTH CARE

ORIGINAL ARTICLE

FOOD PROTEIN-INDUCED PROCTOCOLITIS: SIMILAR APPROACHES AND TREATMENT ACROSS DIFFERENT PEDIATRIC SUBSPECIALTIES

Débora Valente Silva[1], Ana Laura Almeida[1], Inês Pais Cunha[1], Isabel Pais[1,2], Céu Espinheira[1,2], Diana Bordalo[1,3], Sylvia Jacob[1,3], Eunice Trindade[1,2].

[1]Serviço de Pediatria, Unidade local de saúde de São João, Porto, Portugal,
[2]Unidade de Gastrenterologia Pediátrica, Unidade local de saúde de São João, Porto, Portugal,
[3]Unidade de Imunoalergologia Pediátrica, Unidade local de saúde de São João, Porto, Portugal.

ABSTRACT

Introduction: Allergic proctocolitis is an inflammatory condition of the distal colon triggered by specific food proteins, with cow's milk protein (CMP) being the most common culprit.

Objectives: To describe the characteristics and management of allergic proctocolitis cases in a level III hospital. Methodology: A retrospective, cross-sectional review of clinical records, including cases of allergic proctocolitis managed by Pediatric Gastroenterology and Pediatric Immunoallergy clinics.

Results: 97 identified cases (57.5% female), median age at diagnosis of 50 days (IQR 29.5-82 days). CMP was implicated in 100% of cases. Blood in the stool was observed in most patients (87.5%), along with mucus, diarrhea, irritability and weight loss. Feeding practices included exclusive breastfeeding in 45.4% of cases, mixed feeding in 39.2% and formula feeding in 15.5%. Among exclusively breastfed infants, 19 had been exposed to formula during the first week of life. Treatment, involved maternal dietary elimination of the triggering agent in 53.6% of the cases, extensively hydrolyzed formula (EHF) in 55.6% and amino acid-based formula (AAF) in 13.4%. Symptom improvement was achieved within a median of 12 days (IQR 5-21). Reintroduction of the triggering protein occurred at a median age of 6 months (IQR 4-8 months), with tolerance achieved in 69.5% (IQR 5-12 days) of cases within a median of 5-12 days.

Discussion: The findings align with current literature and guidelines on the diagnosis and treatment of allergic proctocolitis. The limited use of amino acid-based formulas and the rapid symptom resolution in most cases underscores the importance of avoiding unnecessary prolonged elimination diets.

ARTICLE HISTORY

Received 27 December 2024

Accepted 6 March 2025

KEYWORDS

Food hypersensitivity, Hematochezia, Cow's milk protein (CMP).

Introduction

Food Protein-Induced Allergic Proctocolitis (FPIAP), is a non-IgE-mediated intestinal inflammatory reaction to food proteins.[1] It is a notable cause of rectal bleeding during the first year of life[2,3], with symptoms typically appearing within the first few months of life.[1,2,4] FPIAP affects 1-2% of infants, with its prevalence among children with rectal bleeding ranging between 18% and 64%.[2,7] Unlike other gastrointestinal conditions, FPIAP is especially common among breastfed infants, accounting for 60% of cases in published studies.[7]

In infants with FPIAP, symptoms may appear acutely- within 12 hours of exposure to the allergenic protein—or more commonly, insidiously, with a delayed onset following prolonged exposure to the triggering protein.[5,6] Hematochezia is the key sign that raises suspicion of FPIAP. Less frequently, infants may present with diarrhea, with or without blood and/or mucus and constipation.[2]

Diagnosis is primarily clinical. A suggestive history, after ruling out infectious and other potential causes of rectal bleeding - alongside the absence of alarm signs, leads to a presumptive diagnosis. Confirmation typically involves symptom resolution following elimination of the triggering protein and recurrence of symptoms upon reintroduction.[8]

Given the high prevalence of FPIAP and its management by healthcare professionals across diverse specialties, this study aimed to characterize cases and review the diagnostic and therapeutic approach to this condition in a level III hospital.

Methods

A retrospective, observational, cross-sectional study was conducted from January 2019 to December 2023. It included all cases of FPIAP from pediatric gastroenterology and pediatric immunoallergy consultations at a level III hospital. Cases were selected through a review of clinical records from these consultations.

Address for Correspondance: Débora Valente Silva, Rua de São Tomé, 1202, Fração U 1º drt/tras, Porto, 4200-488, Portugal.
Email: Debora.rute.valente@gmail.com

©2025 Pediatric Oncall

Table 1. Clinical and Nutritional Characteristics of Patients.

Sex (female), % (n)	**50.5 (49)**
Age at symptom onset (median), days	**50**
Triggering protein	
Cow milk protein	100 (97)
Soy	4,1 (4)
Egg	2,0 (2)
Rice	1,0 (1)
Clinical manifestations, % (n)	
Hematochezia without other symptoms	48,8 (47)
Hematochezia with associated symptoms	46,9 (45)
Mucus	22,6 (22)
Diarrhea	12,3 (12)
Diarrhea	5,0 (5,15)
Less common clinical manifestations, % (n)	
Weight loss	7,2 (7)
Irritability	7,2 (7)
Diet before intervention, % (n)	
Exclusive breastfeeding	45,4 (44)
Mixed feeding	39,2 (38)
Infant formula	15,5 (15)
Diet after intervention, % (n)	
Breastfeeding with elimination of the triggering protein from the maternal diet	54,6 (53)
Extensively hydrolyzed formula (EHF)	57,7 (56)
Amino acid-based formula (AAF)	13,4 (13)
Breastfeeding and EHF	21,6 (21)
Breastfeeding, EHF and AAF	1,0 (1)
Complementary diagnostic tests (CDTs) performed, % (n)	
Bacteriological stool examination	49,5 (48)
Abdominal ultrasound	28,9 (28)
Specific IgEs	19,1 (18)
Rectoscopy	8,2 (8)
No CDTs performed	28,8 (28)
Symptom resolution (median), days	**12**
Tolerance after first re-exposure, % (n)	**65,9 (64)**
Cases that maintain elimination	21,6 (21)
Age of resolution (months)	7

Legend: n: number; CMP: cow's milk protein; BF: breastfeeding; FF: formula feeding; AAF: amino acid-based formula; CDT: complementary diagnostic tests; IgEs: immunoglobulin E

The diagnosis of FPIAP was based on a clinical history of blood and/or mucus in the stools of previously healthy children, with resolution of symptoms following the elimination of the triggering protein and subsequent reintroduction.

The collected data included the following variables: sex, age at symptom onset, triggering protein, presenting signs and symptoms at diagnosis, type of diet at the time of diagnosis, method of eliminating the triggering protein, complementary diagnostic tests performed, presence of allergic comorbidities, family history of atopy, age of reintroduction of the triggering protein and clinical resolution.

Statistical analysis was performed using IBM SPSS software, version 26.0 (IBM Corp., Armonk, New York, USA). Categorical variables were reported as absolute numbers and frequencies. Continuous variables were expressed as median ± interquartile range.

Results

Table 1 summarizes the general characteristics of the studied group. A total of 97 infants were included, 49 (50.5%) of whom were female. The median age at symptom onset was 50 days (IQR 29.5-82 days). In all cases, cow's milk protein (CMP) was identified as the primary trigger. Additionally, soy was identified in four cases, egg in two and rice in one case.

The main clinical manifestation was hematochezia, observed in 87.5% of patients, with 48.8% presenting as the only symptom. Among cases with hematochezia, 46.9% exhibited additional symptoms, most commonly mucus (22.6%), followed by diarrhea (12.3%). In 12.4% of cases without hematochezia, diarrhea was the presenting symptom (5.2%). Other symptoms included irritability (7.2%) and weight loss (7.2%).

Feeding practices at the time of diagnosis varied: exclusive breastfeeding was the most common (45.4%), followed by mixed feeding (39.2%) and formula feeding (FF) (15.5%). After nutritional intervention, 84.6% patients continued breastfeeding, with 54.6% achieving symptom control through elimination of the triggering protein from the maternal diet. Among cases involving FF (54.7%), 57.7% switched to extensively hydrolyzed formula (EHF), while 13.4% required amino acid-based formula (AAF). In more severe cases, more than one therapeutic intervention was necessary: 19.2% of patients transitioned from maternal dietary elimination to EHF and 2.1% required a further switch to AAF. Among exclusively breastfed infants (n=44), 19 were exposed to FF during the first week of life (data was unavailable for 5 cases).

Complementary diagnostic tests (CDTs) were performed in selected cases: bacteriological stool study in 49.5%, abdominal ultrasound in 28.9% and specific IgE testing in 19.1%. Rectoscopy was performed in 8.2% (n=8) of cases, in those with severe symptoms or inadequate response to treatment.

Symptom improvement was observed within a median of 12 days (IQR 5-21 days). Reintroduction of the triggering protein occurred around 6 months of age (IQR 4-8 months), with most reintroductions performed at home (93.3%). Tolerance was achieved in 65.9%. The average age of clinical resolution was 7 months (IQR 5-12 months). However, one patient, now 14 months old, remains on an elimination diet following three unsuccessful oral tolerance tests.

Atopic dermatitis was the most common atopic comorbidity, present in 12.4% of patients. Regarding family history, 10.3% of parents reported asthma, 8.3% had allergic rhinitis and 4.1% had dermatitis.

In terms of specialty follow-ups, 30.9% of patients were managed in pediatric immunoallergy clinics, while the remaining 69.1% were followed in pediatric gastroenterology clinics. Over the five years of the study, there were no differences in therapeutic approaches between the two specialties. However, in the diagnostic approach, a microbiological stool study was performed in 47.4% of patients followed by pediatric gastroenterology consultations versus 0% of those seen in pediatric Immunoallergy consultations.

Discussion

FPIAP is a common cause of rectal bleeding in otherwise healthy infants. Due to the lack of specific complementary diagnostic tests, its diagnosis and management are typically based on clinical history.[9]

Consistent with published findings, most patients with FPIAP in this study were breastfed, with sensitization occurring through maternal ingestion of the triggering protein. Cow's milk protein (CMP) was responsible for the vast majority of cases.[10] This aligns with our data, as 45.4% of the sample were exclusively breastfed and CMP was identified as the trigger in all cases.

FPIAP primarily affects infants during their first year of life[1,2,3,4,5,6,111], with most cases presenting in the first two months. The median age of symptom onset in this study was 50 days and resolution occurred at a median age of 7 months, consistent with the literature. Hematochezia was the predominant clinical sign (87.5%), though 11.4% of cases presented without hematochezia, instead showing symptoms such as diarrhea and/or mucus. Less common symptoms, including irritability and weight loss, were noted in 7.2% of cases.[1,2,3,10,11,12,13] Abdominal discomfort significantly affected feeding behavior in some cases, contributing to weight loss.

Although the diagnostic and therapeutic approach to FPIAP is largely clinical—based on history, physical examination and symptom resolution following elimination of the suspected protein—complementary tests may be warranted in specific contexts. For example, in settings where local epidemiology suggests a need to rule out infectious causes, tests can be informative.[8,14,15,16] In our sample, bacteriological stool testing was the most frequently performed test (n=47) and was negative in all cases. Differentiating FPIAP from infections, such as those caused by Campylobacter jejuni, is critical, although no such cases were observed in this study.

Abdominal ultrasound, performed in over a quarter of cases, was used primarily in emergency settings to exclude acute abdominal conditions at symptom onset. Rectoscopy, while infrequent (8.2%), was justified in cases of atypical symptoms or persistent symptoms requiring escalation of therapeutic interventions, such as suspending breastfeeding or transitioning to amino acid-based formulas.[2] Notably, one rectoscopic examination revealed a juvenile polyp and its removal resulted in symptom resolution.

The cornerstone of FPIAP treatment is eliminating the triggering protein. This can be achieved either through its removal from the maternal diet or by replacing or introducing formula feeding (FF) with an extensively hydrolyzed formula (EHF).[1,2,34,5,6,7,8,9] For cases where symptoms persist despite EHF, transitioning to an amino acid-based formula (AAF) is recommended.5 In this study, most cases achieved symptom resolution through one or both forms of protein elimination: 53.6% adhered to maternal dietary elimination and 55.6% were managed with EHF. Symptom improvement was observed at a median of 12 days. AAF was reserved for a minority of cases (13.4%) where previous measures failed to achieve resolution.

FPIAP is a self-limiting condition and elimination measures are intended to be temporary. In accordance with recommendations, early reintroduction of the triggering protein was proposed in our sample, with

a median reintroduction age of 6 months. Tolerance was achieved in 71.9% of cases. For those who did not achieve tolerance, elimination measures were reinstated, followed by subsequent reintroduction attempts.

Conclusion

The diagnosis and management of allergic proctocolitis cases in our department are consistent with current best practices and had similar results despite the subspecialty. In both of the cases the approach to the diagnosis and treatment was similar. The majority of cases resolved through the elimination of CMP from the maternal diet or the use of extensively hydrolyzed formulas. This approach minimizes the need for amino acid-based formulas or multiple elimination strategies, which were required only in a minority of cases.

Compliance with Ethical Standards
Funding: None
Conflict of Interest: None

References:

1. Caubet JC, Szajewska H, Shamir R, Nowak-Węgrzyn A. Non-IgE-mediated gastrointestinal food allergies in children. Pediatric Allergy and Immunology. 2016 Nov 3;28(1):6-17.
2. UpToDate [Internet]. Uptodate.com. 2025 [cited 2025 Mar 4]. Available from: https://www.uptodate.com/contents/food-protein-induced-allergic-proctocolitis-of-infancy?search=ood-protein-induced-allergic-proctocolitis-of-infancy&source=search_result&selectedTitle=1%7E150&usage_type=default&display_rank=1.
3. Mennini M, Fiocchi AG, Cafarotti A, Montesano M, Mauro A, Villa MP, et al. Food protein-induced allergic proctocolitis in infants: Literature review and proposal of a management protocol. World Allergy Organization Journal. 2020 Oct;13(10):100471.
4. Zhang S, Sicherer S, Berin MC, Agyemang A. Pathophysiology of Non-IgE-Mediated Food Allergy. ImmunoTargets and Therapy [Internet]. 2021 Dec 29;10:431-46.
5. Boné J, Claver Á, Guallar I, Plaza AM. Allergic proctocolitis, food-induced enterocolitis: immune mechanisms, diagnosis and treatment. Allergologia et Immunopathologia. 2009 Feb;37(1):36-42.
6. Nowak-Węgrzyn A, Katz Y, Mehr SS, Koletzko S. Non-IgE-mediated gastrointestinal food allergy. Journal of Allergy and Clinical Immunology. 2015 May;135(5):1114-24.
7. Nowak-Węgrzyn A. Food protein-induced enterocolitis syndrome and allergic proctocolitis. Allergy and Asthma Proceedings. 2015 May 1;36(3):172-84.
8. Human Foods Program. Food Allergies [Internet]. U.S. Food and Drug Administration. 2024. Available from: https://www.fda.gov/food/nutrition-food-labeling-and-critical-foods/food-allergies (Accessed on april 17, 2024).
9. Xanthakos SA, Schwimmer JB, Melin-Aldana H, Rothenberg ME, Witte DP, Cohen MB. Prevalence and outcome of allergic colitis in healthy infants with rectal bleeding: a prospective cohort study. Journal of Pediatric Gastroenterology and Nutrition [Internet]. 2005 Jul 1;41(1):16-22.
10. Anveden-Hertzberg, L., Finkel, Y., Sandstedt, B. et al. Protocolitis in exclusively breast-fed infants. Eur J Pediatr 155. 1996, 464-467.
11. Fox VL. GASTROINTESTINAL BLEEDING IN INFANCY AND CHILDHOOD. Gastroenterology Clinics of North America [Internet]. 2000 Mar;29(1):37-66.
12. Maurizio Mennini, Lionetti E, Malamisura M, Di Nardo G, Auricchio R, Lionetti P, et al. management of food protein-induced allergic proctocolitis in Italy: A nationwide survey by SIGENP. Pediatric allergy and immunology. 2024 Mar 1;35(3).
13. Meyer R, Chebar Lozinsky A, Fleischer DM, Vieira MC, Du Toit G, Vandenplas Y, et al. Diagnosis and management of Non-IgE gastrointestinal allergies in breastfed infants-An EAACI Position Paper. Allergy. 2019 Aug 27;75(1):14-32.
14. Guidelines for the Diagnosis and Management of Food Allergy in the United States: Report of the NIAID-Sponsored Expert Panel. Journal of Allergy and Clinical Immunology [Internet]. 2010 Dec;126(6):S1-58.
15. Piccirillo M, Pucinischi V, Maurizio Mennini, Strisciuglio C, Iannicelli E, Maria Agostina Giallorenzi, et al. Gastrointestinal bleeding in children: diagnostic approach. Italian Journal of Pediatrics. 2024 Jan 23;50(1).
16. UpToDate [Internet]. www.uptodate.com. Available from: https://www.uptodate.com/contents/lower-gastrointestinal-bleeding-in-children-causes-and-diagnostic-approach#H1.