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Hematuria due to Cow Milk Allergy: a case report

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Abstract

Background: Cow milk allergy is one of the most common food allergies in young children causing a wide range of clinical syndromes due to immunologic responses to cow milk proteins. In this report we introduce an infant with dietary protein proctitis due to a cow's milk referred with hematuria and bloody stool.

Case Presentation: Our case was a 10- month old male infant with hematuria and bloody stool following consumption of yogurt. The infant had prior history of blood in stool at 20th day and 2nd month of life while exclusively breastfed. The episodes of bloody stool had been resolved at the time with elimination of cow milk dairy products form the mother's diet. All physical examinations and laboratory tests were normal and with stopping Bovine products, the symptoms were disappeared.

Conclusion: Allergy should be considered as a probable diagnosis in children with otherwise unexplained hematuria.
developed in the left eye. Two patients had no family history suspicious for keratoconus.

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Introduction

Cow milk allergy (CMA) is one of the most common food allergies in young children (1). This food allergy presents with different ranges of clinical syndromes due to being mediated through Ig E or non-Ig E immunoglobulin (2, 3).

Case Presentation

A 10- month- old male infant was referred to our clinic with bloody stool and gross hematuria since the previous day. The infant was a normal baby and all physical examinations were normal. He had been born through vaginal delivery at 39 weeks of gestation and weighed 3300 gr at birth. According to the birth data and our examinations, his growth velocity was within normal limits.

At the age of 20 days, the infant had been admitted to our clinic with bloody stool, while he had been exclusively breast fed and his mother had a history of daily consumption of cow milk. All of physical examinations and lab data, including coagulation tests, had been normal .The diagnosis of cow milk allergy had been made and his mother had been advised to

avoid cow milk and bovine proteins and had been prescribed to receive 800mg calcium daily. The bloody stool had been stopped and the neonate had been discharged with the diagnosis of cow milk allergy.

At the age of 2 months, his mother had consumed cow milk again and the infant had been referred with bloody stool again. The mother could not follow her diet and her infant had been placed on hydrolyzed formula and after the stop of bloody stool had been discharged.

Afterward, there had been no problem and growth and development had been normal and complementary feeding had been started at the age of 6 months. At the age of 10 months and following drinking yogurt, the infant referred with bloody stool and gross hematuria and was admitted in our hospital for complete evaluation.

His mother reported 3-4 times gross hematuria and 2 times bloody stool. Physical examination was normal and no anal fissure was seen. After the insertion of foly catheter, bloody urine was observed. Vital signs were as follow: PR=120, RR=20, T=36.5, BP= 90/60, W=9.500, H=78

LAB data:

CBC: WBC=10.600, HGB=11.3, MCV = 64, MCH=21, MCHC=32, PLT =231000

ESR=21, PT=12, INR=1, PTT=13, BG=B RH=POSTIVE, BS=81, UREA =27, CR=0.5, TOTAL BIL =0.7, C3, C4=normal

TOTAL IGE=10 IU/ml, U/A: (WBC=2-3, RBC=full PH=5.6, SG=1015, HB=neg), U/C=NEG

Kidney was normal in sonography (Fig. 1) and urine volume was 2cc/kg/h.

According to the history of cow milk allergy and normal lab data, bovine proteins were eliminated from the infant's diet. Bloody stool and hematuria stopped after 48 hours and the infant was discharged.

The infant showed no symptom at follow-ups for several months.

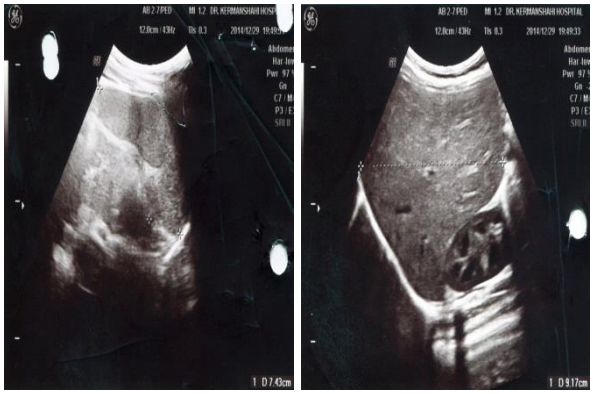

Fig. 1. Ultrasound images of kidney

Discussion

All proteins in cow milk are potential allergens and sensitization to several proteins occurs in most patients (4).

Two main proteins of cow milk are casein (alphaS1-, alphaS2-, beta-, and kappa-caseins) and whey proteins (alpha-lactalbumin, beta-lactoglobulin, bovine lactoferrin, bovine serum albumin, and bovine immunoglobulins). Most likely, sensitivity to milk proteins are due to beta-lactoglobulin, casein, alpha-lactalbumin, bovine serum albumin, bovine lactoferrin and bovine immunoglobulins (4). Bovine lactoferrin, bovine serum albumin and bovine immunoglobulins are minor allergens and 50 percent of patients are sensitized to these minor allergens (4- 6).

Heat changes the biochemical composition of whey proteins, particularly beta-lactoglobulin and allergenicity is lost (7, 8).Therefore, heated milk is better tolerated (9). Similarly, tolerance to yogurt-based dairy products can be explained by fermentation and acidification of milk (8).

Exposure of neonate to cow milk, regardless of receiving it directly or indirectly through ingestion by mother, makes clinical presentation be appeared in the first few days, weeks or months to (2, 3, 10). Patients with CMA show a different range of IgE and non-IgE mediated clinical syndromes.

IgE mediated food-triggered reactions might occur within minutes to two hours after the ingestion. These reactions include skin, oropharyngeal, upper and lower respiratory tract, gastrointestinal tract, and/or cardiovascular signs and symptoms. Reactions can vary from mild to life-threatening anaphylaxis. Peanut, nuts and cow milk are the most common allergens, responsible for food-induced anaphylaxis in pediatric and mixed age populations (10 to 19 percent of cases respectively) (11- 13).

Mixed IgE and non-IgE mediated reactions

Mixed reactions may have either hormonal and/or cell-mediated mechanisms and might present with acute and/ or chronic symptoms.

Atopic dermatitis: Milk allergy, after egg allergy, is the second most common allergy reported in infants and young children with moderate to severe atopic dermatitis (14, 15)

Non-IgE mediated reactions

Non-IgE mediated reactions usually start two hours after the ingestion (15)

Food protein-induced enterocolitis syndrome, allergic eosinophilic gastrointestinal disorders, infantile colic, constipation, food protein-induced enterocolitis syndrome, gastroesophageal reflux, Heiner syndrome, protein-induced proctitis/proctocolitis are non-IgE-mediated reactions.

Protein-induced proctitis/proctocolitis (similar to our patient) usually presents by six months of life with bloody-streaked, mucousy, loose stool and occasionally diarrhea in breastfed or standard formula-fed infants.

Although some cases of allergy and hematuria have been reported in the literature, hematuria as a presentation of cow milk allergy has not been reported in the literature.

The most common causes of gross hematuria in children include irritation of the meatus or perineum, trauma, and urinary tract infection (UTI), and less common causes include IgA nephropathy, nephrolithiasis, sickle cell disease/trait, coagulopathy, glomerular diseases including postinfectious glomerulonephritis , malignancies (for example Wilms' tumor), and drug-induced hemorrhagic cystitis such as what seen with cyclophosphamide (16, 17)

Our patient had no history of trauma or manipulation of genital area. Negative urine culture and normal coagulation and electrophoresis tests ruled out UTI, coagulopathy and sickle cell disease/trait. There was also no evidence of renal stone and malignancies according to the kidney sonography report, no evidence of nephritis according to normal BUN, creat, no proteinuria, and normotensive. There was also no history of consumption of drug-induced hemorrhagic cystitis in the presented case. But, the most important differential diagnosis in our patient was IgA nephropathy that can be presented 40 to 50 percent with one or recurrent episodes of gross hematuria, usually following an upper respiratory infection. It might occur at any age. The presence of IgA nephropathy is established only by kidney biopsy (18-20). In our patient, given that renal function and blood pressure were normal, there was no indication for renal biopsy, but the simultaneous presence of hamturia and hematoshazia and their stop with the elimination of bovine protein and the resurgence of both to start again, made IgA nephropathy as an unlikely diagnosis.

The pathophysiology of hematuria is very different. Glomerular hematuria is caused by basement membrane injury and through inflammatory or immunologic etiology. Hematuria due to chemicals and calculi is caused by toxic damage and mechanical erosion

in renal tube and mucosal surfaces in the genitourinary tract, respectively (21).

In the presented case, hematuria could be due to glomerular basement membrane disruption. It caused by immunologic processes and non-IgE mediated reactions due to Cow milk allergy, like Heiner syndrome (22-24). Although we have no document for this claim, repeated hamaturia and bloody stool following bovine protein consumption is the best proof. This can be the confirmed diagnosis and evidence of precipitating antibodies to cow milk in the serum is controversial.

Ammann and Rossi reported a 3-year-old boy whose mother's family had eczema, asthma, and hay fever. At the age of 4 weeks the patient had history of seborrhoeic dermatitis. At the age of 5 months he was asthmatic and had subsequent repeated asthmatic attacks and episodes of hematuria developed at the age of 21 months.

The diagnosis was confirmed by repeated application of the provocation test asthma and eosinophilia and on one occasion was followed by an eczematoid rash. (24).

Lelong M and Pegeon B. reported two children presenting with frequent episodes of hematuria with asthma attacks and allergic rhinitis. Provocation test with a mite triggered hematuria (25).

Graham DM, et al have presented simultaneous occurrence of hematuria and episode of allergy in a child with idiopathic episodic gross hematuria and significant history of environmental allergies (26).

History and laboratory testing, when available, are the basis of diagnosis (28,). Although, clinician supervised double-blind, placebo controlled oral food challenge is the gold standard.

Conclusion

Allergy should be considered as a differential diagnosis in children with unexplained hematuria.

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