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The Potential for Gastrointestinal Parasitic Infections to Cause Chronic Hives in Children may Increase in the United States

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Abstract

Chronic hives in children are not infrequently seen in Allergy-Immunology clinics. Hives persisting for greater than 6 weeks often do not have a readily identified reason. In developed countries, the development of hives from chronic parasitic infestation is uncommon, with reviews suggesting a low incidence of parasitic involvement as a cause for chronic pediatric hives.

Increased immigration into the United States from international countries has the potential to add unusual infections from developing countries into the mainstream of American medical practices.

Keywords: *hives, parasites, chronic spontaneous hives, idiopathic urticaria, urticaria.*

We present here a pediatric case of long-term hives with an eventual determination of parasitic involvement, re-emplacing the potential for parasites to induce hives in children, especially after international travel, or after immigration from developing countries.

Case Report

A 14-year-old male presented to Allergy and Immunology clinic with symptoms of hives and chronic abdominal pain for 3 years. He describes his abdominal pain as crampy and mainly epigastric and occasionally in the lower abdomen. It increases after meals. This pain does not wake him up from sleep. It is associated with nausea and infrequent heartburn. Pain decreased with the avoidance of gluten and cow's milk for 3-4 months prior to clinic visit. He denies canker sores or oral thrush. No odynophagia. No abdominal distention. His stool pattern was normal. He describes soft stools, once daily with no blood or mucus. No anal itching. He has a previous diagnosis of communicating hydrocephalus on VP shunt and history of atopic dermatitis at a younger age. He had adermatographic response in the clinic with allergy skin testing. His allergy testing was most positive for weed pollen, dust mites and cockroaches.

On examination he had no active atopic dermatitis and unremarkable abdominal examination including the perianal area. A previously obtained blood counts from 2017 showed eosinophils of 23.5 %. Repeated CBC at this visit showed eosinophils of 13.2 %. Tryptase test was normal (3.3 microgram/l). Celiac screening panel is negative. Immunoglobulins were normal. An IgE was not done. The urticaria inducing activity test was negative. Thyroid function was normal. ESR and CRP were unremarkable. A single stool was negative for Giardia and cryptosporidium.

He was initially started on high dose cetirizine and ranitidine. He was maintained on regular diet and stop avoiding gluten and dairy. After one month of treatment he continued to have abdominal pain and hives. He was referred to gastroenterology service for consultation. At GI clinic, he had an additional symptom of diarrhea which was described as pasty to formed stool 3 time a day for the last 3 weeks. Patient felt that diarrhea started after re-introduction

of gluten and dairy to his diet. He denied any history of recent travel. Decision was made to proceed with upper and lower endoscopy for evaluation of chronic abdominal pain and diarrhea. Upper endoscopy was normal. Lower endoscopy showed multiple perianal pinworms (Enterobiusvermicularis) and more pinworms in different sites inside his rectum. His Disaccharide test on intestinal biopsies showed lactase deficiency. Another 2nd stool testing for ova and parasite two days prior to endoscopy came back positive for Dientamoeba fragilis.

The patient was started on Albendazole and Metronidazole. He was started on a lactose free diet. Patient was seen again in allergy clinic 4 weeks after finishing treatment. He had no abdominal pain or hives. CBC was done at this clinic visit showed eosinophils decreased to 5.4%. Upon further discussion with family, a history of travel to Honduras for a family visit was documented 3 years previous.

Discussion

In a pediatric patient, even without international travel or previous developing nation living status, chronic hives are not common, and when persistent often are referred to Allergy specialty clinics. The differential diagnosis is complex, and can often result as an idiopathic category. This situation is currently termed chronic spontaneous urticaria (CSU). (1)

The therapy for chronic hives as undergone refinement recently, but children often are too young for Omalizumab, or parents are too concerned about using long term medication.(1)It therefore behooves the medical practitionerto consider all potential causes for the hives in children, especially when chronic, or other medical conditions co-exist.

In this case report a thorough laboratory assessment of causes of chronic hives revealed the eosinophilia, and coupled with the chronic abdominal pain resulted in an abdominal endoscopy. The parents had only provided one stool sample prior to the endoscopy, and the 2nd sample provided further clarification for causation. The total resolution of hives and abdominal pain after therapy for the parasitic infection was reassuring of the correct diagnosis.

A thorough literature search for the last 10 years included here summarizes the association of hives and parasitic infection.

In a systematic review done by Kolkhir et al for the time period between 1940 to 2015 looking into parasitic infection and chronic urticaria in adult and children, the prevalence of parasitic infection in children with chronic spontaneous urticaria CSU and the efficacy of anti-parasitic medication in CSU symptoms were found to have a wide range of 0–37.8 and 0–100%, respectively. Also, the review identified 17 studies from countries with low rates of parasitic infections (including US). Rates of parasitic infection in CSU patients in those countries were ranging between 0–75.4% including adults and children. The review found that B. hominis and Giardia spp. to be the most common parasite causing CSU.(2)

Another systematic review was doneby Caffarrell et al. The percentage of parasitic infection as a cause of childhood urticaria in the 6 involved studies was ranging between 0 and 5.3%. (3)

Astudy from Yilmaz et al evaluated the prevalence of parasitic infection-related CSU in Turkey. This study showed gastrointestinal complaints were significantly more frequent in patients withparasitic infection-related CSU than in those without. Interestingly, some of the patients with parasitic infection-related CSU did not have any gastrointestinal symptoms. The authors suggest that parasites should be investigated routinely as a causative factor of childhood CSU not only in tropical countries. They conclude that parasites may cause CSU, and remission may only be possible with the treatment of parasitic infection. (4)

A prospective study from Thailand was looking into the natural history of chronic urticaria in children. The study showed only 5.4 % of CU patients found to have parasitic infection. All of them have no gastrointestinal symptoms. Parasitic infection treatment did not induce higher remission rate of CU in comparison to CU patients with negative stool studies. (5)

A study done in rural Cambodia looking into Strogyloidessterocoralis as a cause of abdominal pain, diarrhea and urticaria. 66.7% of patients tested positive for S. sterocoralis reported to have urticaria during the previous six months. (6)

A case-control study done in Egypt comparing stool studies from patient with urticaria with patient with no urticaria.Blastocystishominis was isolated in 61.1% of patient with urticaria and 8 % of control group patients. Also, there was no significant difference

in positive B. hominis between acute and chronic urticaria patients. (7)

A clinical review was done to compare the US and international perspective on urticaria guidelines. Both guidelines did not mention stool studies as a part of routine laboratory testing for CSU. (8) They emphasize that additional tests might be appropriate based on either patient's medical history or the clinician suspicion for an existing underlying cause. (8) (9).

A large review for studies from 1960 to 2017 was done looking into association between urticaria and nematodes infections. Authors conclude that it is difficult to detect a certain causal effect between urticaria and nematodes, except when urticaria improves after infection treatment. (9)

International immigration plays a role in infectious disease transmission into the United States and other developed countries. Intestinal parasitic infections are major part of infection among refugees in US. The most prevalent parasite was *Giardia lamblia*, though various other parasites were introduced depending on the country of origin.(10) There is no clear international consensus or guidelines for screening new immigrants for intestinal parasites.

Eosinophilia might be the only clue for parasitic infections in asymptomatic immigrants. A study done on children immigrated to Spain from tropical and subtropical regions. 60 % of children with relative eosinophilia (eosinophils >5%) were found to have parasitic disease compared to 2% only in patient without relative eosinophilia.(11)

The presence of asymptomatic patients and no clear guidelines for screening new immigrants and the unfamiliarity of health-professionals with some of the imported infections are all potential causes for missing some infections which might increase morbidity and transmission among local communities.(10, 12) The prevalence of parasitic infections in immigrant populations in Chicago has been recently assessed. (13)

The potential for chronic hives to be caused by parasitic infection needs to be considered in all cases, and may emerge as a larger pediatric concern with the increase in under-developed nation immigration into the United States.

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