Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v2023i1.454
*Biol. Clin. Sci. Res. J., Volume, **2023**: 454*
Original Research Article

INCIDENCE OF INTESTINAL PARASITES IN CHILDREN WITH CHRONIC SPONTANEOUS URTICARIA

BUKHARI AA[*1], BUKHARI AA[2], AKRAM A[3], NAEEM N[4], ZAFAR AF[5], ARSHAD G[5]

[1]*Department of Family Medicine, Concept Fertility Centre Multan, Pakistan*
[2]*Department of Pathology, Multan Medical and Dental College (MMDC) Multan, Pakistan*
[3]*Department of Microbiology and Molecular Genetics, The Women's University Multan, Pakistan*
[4]*Department of Pathology, Faisalabad Medical University Faisalabad, Pakistan*
[5]*College of Food and Nutrition Sciences, Multan Medical and Dental College (MMDC) Multan, Pakistan*
**Correspondence author email address: drfarah123@yahoo.com*

(Received, 09th July 2023, Revised 27th August 2023, Published 14th October 2023)

Abstract: *This study aimed to investigate the incidence of intestinal parasites in children who have been diagnosed with chronic spontaneous urticaria. A prospective control study was conducted at the Pathology Department of MMDC, Multan. The study included a total of 150 children, both from government and private schools. The children were divided into two groups: group A comprised 80 children diagnosed with chronic spontaneous urticaria, and group B included 70 healthy children. Group A was assessed for intestinal infections, and those with parasites were given anti-parasitic therapy. The outcomes were then evaluated. Out of the participants in group A, 18 (22.5%) had intestinal parasitic infections (IPI), compared to 10 (14.2%) in group B. Although the incidence of IPI was higher in group A, the difference was not statistically significant (P=.181). Blastocystis sp. was found in 14 (17.5%) patients in group A and 10 (14.2%) in group B. The eosinophil percentage in group A was 2% (.6% - 3.7%), and in group B was 1.5% (.6% - 2.2%) (P= .045). The total IgE value in group A was 97.6 IU/mL (ranging from 29-246 IU/mL), and in group B was 31.6 IU/mL (ranging from 14.2-65.8 IU/mL) (P <.001). Patients diagnosed with IPI were treated with metronidazole; out of the 18 patients, 10 (55.5%) saw an end to their urticaria symptoms. The results of this study suggest that Blastocystis sp. and D. fragilis were the most common parasites found in children with urticaria, which can disrupt their lifestyle.*

Keywords: Intestinal parasites, pediatric, chronic spontaneous urticaria, anti-parasite therapy

Introduction

Urticaria is a dermatologic disorder involving mucous membranes and skin, characterized by itchy plaques, erythema, and edema. It can be chronic and acute. Acute urticaria is triggered by stress, insect venom, food, medications, or infections and lasts < 6 weeks (Kanani et al., 2018; Kayiran and Akdeniz, 2019). Chronic urticarial (CU) lasts > 6 weeks and is characterized by recurrent urticaria. Stimulants may trigger it, or it develops without stimulants, and it is called chronic spontaneous urticarial (CSU). The cause of CSU remains unknown in 90% of cases; infections like intestinal parasitic infections (IPI), food intolerance, and autoimmunity are some common causes (Abdelaziz et al., 2021; Metz et al., 2021). Studies have been conducted on the association between IPI and CSU (Gereige et al., 2020). Intestinal parasitic infections are common health issues in developing countries. Poor hygiene, living conditions, and low socioeconomic status enhance the risk of infections. IPI affects about 1 billion people globally, Entamoeba, Dientamoeba fragilis, G. duodenalis, Blastocystis sp, intestinal protozoaas, Strongyloides stercoralis, Ancylostoma duodenale, Necator americanus, Trichuris trichiura, and Ascaris lumbricoides are most prevalent intestinal parasites (Hernández et al., 2019).

Blastocystis is a common protozoon found in stool, but its pathogenicity and clinical importance are unknown. Blastocystis has have symptoms like abdominal pain, nausea, vomiting, diarrhea, anorexia, bloating, and urticaria (Bahrami et al., 2020). This study analyzes the association between IPI and CSU in pediatric patients. We also compared the incidence of infections with health controls. The impact of anti-parasitic treatment on CSU symptoms was also assessed.

Methodology

A prospective control study was conducted in the Pathology Department of MMDC, Multan. Pediatric patients aged < 18 years, with CSU having urticarial plaque, were included. Those with any known causes of CU were excluded. A total of 150 pediatric patients attending government and private schools were included in the study. Patients were divided into groups A and B. Group A consisted of 80 pediatric patients with chronic spontaneous urticaria, and group B included 70 healthy participants. Informed consent of the participants was taken. The ethical board of the hospital approved the study.

Fresh stool samples of the participants were collected and sent to the laboratory. Samples were examined under the direct microscope and through Wheatley's trichrome staining. Serum samples of the participants were also

[Citation Bukhari, A.A., Bukhari, A.A., Akram, A., Naeem, N., Zafar, A.F., Arshad, G. (2023). Incidence of intestinal parasites in children with chronic spontaneous urticaria. *Biol. Clin. Sci. Res. J.*, **2023***: 454.* doi: https://doi.org/10.54112/bcsrj.v2023i1.454]

collected, and the total IgE and eosinophils ratio was detected using automatized systems.

For treatment, Metronidazole therapy (30 mg/kg/day) was prescribed for 10 days. After 10 days, a parasitic investigation was performed again, and information about urticaria symptoms was collected.

SPSS version 23 was used for data analysis. Descriptive data was presented as mean and standard deviation. Chi-square analyses or Fisher's exact test were performed for categorical data. P value < 0.05 was considered statistically significant.

Results

Of 150 patients, 64 (42.6%) were male. The demographic data of the study and control group is shown in Table I. There was no statistically significant difference regarding gender and age in both groups. IPI was detected in 18 (22.5%) Group A and 10 (14.2%) participants in Group B. Though the incidence of IPI was higher in group A, the difference was statistically insignificant (P=.181).

The distribution of parasites in group A was as follows: 14 (17.5%) patients had Blastocystissp, 1 (1.25%) had D. fragilis, and 2 (2.5%) G.duodenalis. The distribution of parasites in group B was as follows: 10 (14.2%) participants had Blastocystis sp., 1 (1.4%) had D. fragilis, 1 (1.4%) had G. duodenalis, 1 (1.4%) had E. coli and 1 (1.4%) had Enterobius vermicularis (Table II). Group A had a higher incidence of Blastocystissp. Compared to group B, this difference was statistically insignificant (P=.155).

The eosinophil percentage in group A was 2% (.6% - 3.7%), and in group B was 1.5% (.6% - 2.2%) (P= .045). The total IgE value in group A was 97.6 IU/mL (29-246 IU/mL), and in group B was 31.6 IU/mL (14.2-65.8 IU/mL) (P <.001).

Patients diagnosed with IPI were treated with metronidazole. Of 18 patients, urticaria symptoms ended in 10 (55.5%) patients.

Table I Demographic data of the participants

Group	Male	Female	Mean age	P value
Study group	35	45	10.15 ± 4.7	0.49
Control group	38	32	9.1 ± 5.3	

Table II Distribution of parasites between study groups.

Parasite	Study group	Control group	P value
Blastocystis sp.	14 (17.5%)	10 (14.2%)	0.15
D. fragilis	1 (1.25%)	1 (1.4%)	0.36
G. duodenalis	2 (2.5%)	1 (1.4%)	0.78
E. coli	0	1 (1.4%)	-
Blastocystis spp. and E.coli	1 (1.4%)	1 (1.4%)	0.78
E. vermicularis	0	1 (1.4%)	-

Discussion

Chronic spontaneous urticaria disturbs sleep pattern and daily activities, lowers the quality of life, and cause social isolation and emotional disorders. Several studies show that CU severely impacts psychological state, particularly in pediatric patients (Caffarelli et al., 2019). CSU is associated with inflammation, underlying infection, stress, autoimmunity, and pseudo allergens. Parasitic infections are the major cause of urticaria, particularly in developing states (Arik Yilmaz et al., 2016). In the current study, IPI was detected in 18 (22.5%) group A and 10 (14.2%) participants in group B. These were the results of limited single stool examination, which may have caused an underestimation of prevalence. A previous study reported that 5.5% of pediatric patients with CSU had G. duodenalis, D. fragilis, and Blastocystissp. (Kim et al., 2022). Another study reported a 10% prevalence of IPI in CSU pediatric patients, and the most prevalent parasites were E. vermicularis, D. fragilis, G. duodenalis, and Blastocystis sp.(Tuzer et al., 2022). A study conducted on pediatric patients with CSU prevalence of IPI was 38.7% in the study group and 11.2% in the control group. The study showed that the most prevalent parasites were G. duodenalis and Blastocystis sp.(Vezir et al., 2019).

In another study, Blastocystis sp. It was detected in 21% of patients and 12.1% of controls, and the difference was statistically significant (Kocahan et al., 2019). In the current study, IPI was detected in 22.2% of patients and 14.5% of controls, and Blastocystissp. Was most prevalent, similar to the previous study's findings. The difference in the rate of IPI between both groups was statistically insignificant. Patients diagnosed with IPI were treated with metronidazole. Of 18 patients, urticaria symptoms ended in 10 (55.5%). Studies show that anti-parasitic treatment leads to the disappearance of urticaria in most patients. A study reported that urticarial symptoms ceased in 47.5% of CSU patients receiving anti-parasitic therapy (Azami et al., 2023).

The studies reveal that the most prevalent intestinal parasite in CSU patients was Blastocystis sp. Despite the research, the pathogenicity of Blastocystis remains controversial. A recent study has made an interesting discovery, stating the association of Blastocystis with a healthy gut (Abedi et al., 2022). Our study suggests that CSU patients have a higher prevalence of Blastocystis sp. than the control group. Another protozoan reported in our study was D. fragilis. It was not associated with gastrointestinal symptoms. Previous studies have reported an association between D. fragilis and gastrointestinal symptoms (Liu, 2021).

Conclusion

Intestinal parasites are detected in CSU patients regardless of the presence or absence of gastrointestinal symptoms. Anti-parasitic therapy alleviates symptoms and increases quality of life.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned.

Consent for publication

Approved

Funding

Not applicable

[Citation Bukhari, A.A., Bukhari, A.A., Akram, A., Naeem, N., Zafar, A.F., Arshad, G. (2023). Incidence of intestinal parasites in children with chronic spontaneous urticaria. *Biol. Clin. Sci. Res. J.*, **2023***: 454.* doi: https://doi.org/10.54112/bcsrj.v2023i1.454]

Conflict of interest

The authors declared absence of conflict of interest.

References

Abdelaziz, M., Sayed, A., Ibrahim, H., and Hegazy, E. (2021). Is Helicobacter pylori infection related to chronic idiopathic urticaria: an updated review. *SVU-International Journal of Medical Sciences* **4**, 162-165.

Abedi, S. H., Fazlzadeh, A., Mollalo, A., Sartip, B., Mahjour, S., Bahadory, S., Taghipour, A., and Rostami, A. (2022). The neglected role of Blastocystis sp. and Giardia lamblia in development of irritable bowel syndrome: A systematic review and meta-analysis. *Microbial Pathogenesis* **162**, 105215.

Arik Yilmaz, E., Karaatmaca, B., Sackesen, C., Sahiner, U. M., Cavkaytar, O., Sekerel, B. E., and Soyer, O. (2016). Parasitic infections in children with chronic spontaneous urticaria. *International archives of allergy and immunology* **171**, 130-135.

Azami, M., Amini Rarani, S., and Kiani, F. (2023). Treatment of Urticaria caused by severe cryptosporidiosis in a 17-month-old child–a case report. *BMC Infectious Diseases* **23**, 461.

Bahrami, F., Babaei, E., Badirzadeh, A., Riabi, T. R., and Abdoli, A. (2020). Blastocystis, urticaria, and skin disorders: review of the current evidences. *European Journal of Clinical Microbiology & Infectious Diseases* **39**, 1027-1042.

Caffarelli, C., Paravati, F., El Hachem, M., Duse, M., Bergamini, M., Simeone, G., Barbagallo, M., Bernardini, R., Bottau, P., and Bugliaro, F. (2019). Management of chronic urticaria in children: a clinical guideline. *Italian journal of pediatrics* **45**, 1-25.

Gereige, J., Chen, C., and Guenechea-Sola, M. (2020). A Systematic Review of Helicobacter pylori Eradication and its Effect on Chronic Idiopathic Urticaria. *Journal of Allergy and Clinical Immunology* **145**, AB202.

Hernández, P. C., Morales, L., Chaparro-Olaya, J., Sarmiento, D., Jaramillo, J. F., Ordoñez, G. A., Cortés, F., and Sánchez, L. K. (2019). Intestinal parasitic infections and associated factors in children of three rural schools in Colombia. A cross-sectional study. *PLoS One* **14**, e0218681.

Kanani, A., Betschel, S. D., and Warrington, R. (2018). Urticaria and angioedema. *Allergy, Asthma & Clinical Immunology* **14**, 1-13.

Kayiran, M. A., and Akdeniz, N. (2019). Diagnosis and treatment of urticaria in primary care. *Northern clinics of Istanbul* **6**, 93.

Kim, H., Hyun, M. C., and Choi, B. S. (2022). Natural history and influencing factors of chronic urticaria in children. *Allergy, Asthma & Immunology Research* **14**, 73.

Kocahan, T., AKINOğlU, B., and HASANOğlU, A. (2019). Effect of intestinal parasites on anaerobic performance and muscle strength in athletes. *Medical Journal of Islamic World Academy of Sciences* **27**, 17-24.

Liu, D. (2021). Molecular Epidemiology of Dientamoeba fragilis. *In* "Molecular Food Microbiology", pp. 425-430. CRC Press.

Metz, M., Altrichter, S., Buttgereit, T., Fluhr, J. W., Fok, J. S., Hawro, T., Jiao, Q., Kolkhir, P., Krause, K., and Magerl, M. (2021). The Diagnostic Workup in Chronic Spontaneous Urticaria—What to Test and Why. *The Journal of Allergy and Clinical Immunology: In Practice* **9**, 2274-2283.

Tuzer, C., Yegit, O., Ozturk, N. S., Demir, S., Demirpek, U., Boral, O. B., Buyukozturk, S., Gelincik, A., and Colakoglu, B. (2022). Relationship between Blastocystis spp. with Accompanying Food Hypersensitivity and Chronic Spontaneous Urticaria. *International Archives of Allergy and Immunology* **183**, 1259-1269.

Vezir, S., Kaya, F., Vezir, E., Karaosmanoğlu, N., and Adiloğlu, A. K. (2019). Evaluation of intestinal parasites in patients with chronic spontaneous urticaria in a territory hospital in Turkey. *The Journal of Infection in Developing Countries* **13**, 927-932.

[Citation Bukhari, A.A., Bukhari, A.A., Akram, A., Naeem, N., Zafar, A.F., Arshad, G. (2023). Incidence of intestinal parasites in children with chronic spontaneous urticaria. *Biol. Clin. Sci. Res. J.*, **2023***: 454*. doi: https://doi.org/10.54112/bcsrj.v2023i1.454]