

Etiopathogenetic Association with Intestinal Parasitosis in Children with Skin Hypopigmentation

Mirzoyeva M. R., Jabborova O. I., Sagdullaeva G. U.

Bukhara State Medical Institute, Uzbekistan

Abstract The total IP prevalence in patients with PA in Tashkent ($62.0 \pm 4.8\%$) and Bukhara ($92.0 \pm 2.7\%$) was higher than in the control groups ($30.0 \pm 4.5\%$) and ($43.0 \pm 4.9\%$) ($P < 0.05$). AT gave the best results in PA patients infected with *H. nana* and *G. lamblia*: complete disappearance of hypopigmentation patches (HP) was observed in 60.5% and 48.0% of patients, respectively, and decrease in the intensity, size and/or number of HP was observed in 34.4% and 34.0% respectively. Eventually a positive clinical effect with concomitant hymenolepiasis and giardiasis was observed in 94% and 82% of PA patients. The clinical response was less pronounced in enterobiasis.

Keywords Hypopigmentoses, Pityriasis alba, *E. vermicularis*, Microbiology, Antiparasitic

1. Introduction

Skin hypopigmentoses include several diseases, in Uzbekistan there are vitiligo and a benign form of hypopigmentation that affects mainly children and adolescents, and is classified in Western literature as Pityriasis alba (PA). [8]. RAH is characterized by indistinctly defined areas of hypopigmentation (UG), usually oval or rounded, mainly localized on the face (in the main cheeks), arms and upper torso. UG is more noticeable in people with dark skin, and is more common in males [12]. RA does not belong to contagious diseases and so far there are no indications of an infectious etiology of this disease [6,9]. The main complaint of RA patients is a cosmetic defect, but despite this, the patients themselves and their parents usually give an acute negative emotional reaction to the disease. Etiopathogenesis of wounds is explained, so treatment is usually ineffective and haphazard.

Rashiroko is common in countries with tropical and subtropical climates [12,5,7,4,13], usually endemic to helminths and pathogenic protozoa [11]. Uzbekistan is a region endemic to intestinal parasites [1,2], and RA is often diagnosed in the Republic. There is no information about infection with intestinal parasites in RA patients and their possible impact on the development and course of RA. In this regard, the comparative characteristics of RA patients infected with intestinal parasites in two regions of the Republic were of interest.

2. The Purpose

The purpose of this study was to determine the infestation of intestinal helminths and pathogenic protozoa in RA patients with an assessment of the clinical response to antiparasitic therapy and the possible role of parasites in the pathogenesis of RA.

3. Materials and Methods

Research was conducted in Tashkent from May 2017 to 2018 in the research Institute of epidemiology, Microbiology and infectious diseases of the Ministry of Health, in Bukhara - in the same period of time at the Bukhara medical Institute.

Groups of patients with CRA in both cities included children aged 5 to 14 years (100 patients in each city). Among RA patients in Tashkent and Bukhara, boys prevailed: 70% and 65%, respectively.

The diagnosis of RA was based on a detailed study of the medical history and the results of a clinical examination. Patients were found to have UG with indistinct edges, round or oval shape, size from 0.5 to 5 cm, mainly located on the face, neck, arms, and less often on the upper torso. Some UGS showed mild erythema. The number of UGS varied from 4 to 10. PA diagnosed according to Tenth Revision of International Classification of diseases (ICD-10).

Control groups included healthy children (100 people in each city) without any complaints, acute and chronic diseases. In Tashkent, the control group included 78 boys and 22 girls, and in Bukhara — 71 and 29, respectively.

All participants in the study are residents of Uzbekistan.

Parasitological examination included three-time coproscopy with an interval of 2-3 days. Stool samples were

collected in Turdiev's preservative. In case of negative coproscopy results, the modified Ritchietal concentration method was used. (1952) [10]. Additional examination was performed in RA patients 2 and 6 weeks after completion of antiparasitic therapy prescribed after diagnosis of parasites.

Treatment. Antiparasitic therapy was performed after receiving the results of the initial examination and informed consent to treatment of patients and/or their parents.

RA patients with ascariasis were treated with a single dose of 400 mg of albendazole.

Patients with RAS enterobiosis were prescribed mebendazole (once 100 mg with a repeat after 2 weeks.).

RA patients infected with *Hymenolepis nana* (H. nana) were treated with praziquantel (a single dose of 25 mg/kg with a repeat after 4 days).

PA patients infected with *Giardialamblia* (G. lamblia) were treated with metronidazole (the dose and duration of the course were 15-22.5 mg/kg/day for 10 days).

Patients with RA with mixed infection *E. vermicularis*+*G. lamblia* were prescribed mebendazole (once 100 mg with a repeat after 2 weeks.) and metronidazole (the dose and duration of the course were 15-22.5 mg / kg / day for 10 days).

RA patients with mixed *E. vermicularis* +*H. nana* infection were prescribed mebendazole (once 100 mg with a repeat after 2 weeks.) and praziquantel (a single dose of 25 mg / kg with a repeat after 4 days).

Individuals from control groups infected with parasites were also treated using the above-mentioned drugs and regimens. The effectiveness of treatment was evaluated by repeated examination after completing the course of therapy. Patients and their parents were informed about the ways of infecting intestinal parasites and the importance of observing hygiene rules. All RA patients received information sheets on the prevention of intestinal infections.

The clinical efficacy of parasite elimination was evaluated

2 and 6 weeks after completion of antiparasitic therapy.

Positive clinical effect: complete disappearance and decrease in the intensity of hypopigmentation, the size of UG and their number.

The negative clinical effect was characterized by the absence of visible changes in UG or an increase in their number and size.

Statistical processing was performed using the Origin 6.1 program (Origin Lab, Northampton, MA). We used methods of variation statistics with the calculation of the arithmetic mean of the studied indicator (M), the mean square deviation (σ), the standard error (m), and relative values (frequency, %). The statistical significance of the obtained measurements when comparing the average values was determined by the student's criterion (t) with the calculation of the error probability (P). The confidence level $P < 0.05$ was taken as statistically significant changes.

4. Results and Discussion

In table. 1 data for determining intestinal parasite infestation in RA patients and control groups in Tashkent and Bukhara are presented. The total infection rate of RA patients with intestinal parasites in Bukhara was significantly higher than in Tashkent: $92.0 \pm 2.7\%$ and $62.0 \pm 4.8\%$, respectively ($P < 0.05$). Parasite infestation in the control group was also higher in Bukhara – $43.0 \pm 4.9\%$ and $30.0 \pm 4.5\%$, respectively, but the differences were not reliable ($P > 0.5$). Infection with intestinal parasites in RA patients in Tashkent and Bukhara is significantly higher than in the corresponding control groups.

The species structure of parasites in RA patients and control group individuals is the same, infection with individual pitchforks in RA patients either tends to increase or is significantly higher. than in the control.

Table 1. Infection with intestinal parasites in patients with GP and control groups in Tashkent and Bukhara (abs./%)

no. surveyed group	number of persons infected with parasites (abs./%)					
	<i>a. lumbricoides</i>	<i>e. vermicularis</i>	<i>h. nana</i>	<i>g. lamblia</i>	mixed parasitoses	
					<i>e. vermicularis</i> + <i>g. lamblia</i>	<i>e. vermicularis</i> + <i>h. nana</i>
Tashkent						
patient GP (n=100)	1/1 ±0.9	19/19±3.9	12/12 ±3.2*	22/22 ±4.1*	8/8±2.7	-
control grou p (n=100)	2/2.0 ±1.4	13/13±3.3	3/3±1.7**	12/12 ±3.2	-	-
Bukhara						
patient GP (n=100)	6/6 ±2.3	30/30 ±4.5	17/17 ±3.7	28/28 ±4.4	5/5 ±2.1*	6/6 ±2.3
control grou p (n=100)	4/4.0 ±1.9	24/24 ±4.2	10/10 ±3.0	20/20 ±4.0	2/2 ±1.4	3/3 ±1.7

Note: * - Reliability of differences between-1st and 2nd, 3rd and 4th groups; ** - Reliability of differences between 1st and 3rd, 2nd and 4th groups

In the control group, which included residents of Tashkent, mixed infections were not diagnosed, in the control group in Bukhara-they are represented by a combination of *E. vermicularis* with *G. lamblia* and *H. nana*.

Antiparasitic therapy resulted in the elimination of parasites in 100% of cases, both in RA patients and in control groups. in Tashkent and Bukhara. It seems that a certain role was played by strict adherence to the drug administration scheme, as well as familiarization of each infected person with the ways of infection with intestinal parasites, which prevented repeated cases of infection.

Clinical evaluation of antiparasitic therapy in RA patients infected with intestinal parasites showed a positive clinical effect after 2 and 6 weeks, but it was more pronounced after 6 weeks: complete disappearance of UG and a decrease in the intensity, size and / or number of UG was determined in RA patients in Tashkent in 40.3% and 20.9%, respectively. In General, a positive clinical effect of antiparasitic teraepia was observed in 60.3% of RA patients. However, visual changes were absent in 16 (25.8%) RA patients, and 8 (12.7%) had an increase in the size and number of UGS.

Similar results were obtained when analyzing the clinical effect in patients with GP in Bukhara. Therefore, to assess the clinical effectiveness of antiparasitic therapy 6 weeks after its completion in RA patients, depending on the type of parasite, RA patients from Tashkent and Bukhara were grouped into one group, including: 154 greenhouses infected with parasites. The results are shown in table. 2.

The table shows that the elimination of parasites gave the best results in RA patients infected with *H. nana* and *G.*

lamblia: complete disappearance of UG was observed in 60.5% and 48.0% of patients, respectively, and a decrease in the intensity, size and/or number of UG in hymenolepidosis and giardiasis was observed in 34.4% and 34.0%. As a result, a positive clinical effect in concomitant hymenolepidosis and giardiasis was observed in 94% and 82% of RA patients. The clinical response was less pronounced in enterobiosis: complete disappearance of UG was observed in 34 patients. 6%. In mixed parasites, there was no positive clinical effect, despite the elimination of parasites.

This study is the first to analyze the role of intestinal parasitosis in the etiopathogenesis of RA. Our data show that the contribution of individual species to the development of pathology differs, however, a high level of positive clinical response to the elimination of parasites in RA patients infected with *H. nana* and *G. lamblia*, indicates their influence on the initiation and course of RA. It is also clear that RA is a multi-factorial disease, and the mechanisms responsible for the development of hypopigmentation require additional research. Here are the results on the leading position of *H. nana* and *G. lamblia* in the structure of intestinal parasites in RA patients and the high level of positive clinical response of these patients to antiparasitic therapy indicate a possible connection between the formation of hypopigmentation and the pathogenesis of these parasites. Apparently, it is not by chance that the most effective effect of antiparasitic therapy of hymenolepidosis and giardiasis, which cause pronounced and long-lasting changes in the permeability of the intestinal barrier, causing a wide range of effects on skin conditions [3].

Table 2. Clinical effectiveness of antiparasitic therapy 6 weeks after its completion in RA patients, depending on the type of parasite

Clinical Exodus	The number of patients with RA (154) s					
	<i>E. vermicularis</i> (n=49)	<i>H. nana</i> (n=29)	<i>A. lumbricoides</i> (n=7)	<i>G. lamblia</i> (n=50)	<i>G. lamblia</i> + <i>E. vermicularis</i> (n=13)	<i>E. vermicularis</i> + <i>H. nana</i> (n=6)
Complete disappearance UG	17 (34.6±6.7)	18 (60.5±9.0)	-	24 (48.0±7.0)	-	-
Decrease in intensity, size and / or number of UG	-	10 (34.4±8.8)	-	17 (34.0±6.6)	-	-
Lack of visible changes in HS	15 (30.6±6.5)	-	7 (100)	5 (10.0±4.2)	9 (69.2±13.8)	5 (83.3±)
Increase in size and / or amount of HS	15 (30.6±6.5)	-	-	-	3 (23/0±11.6)	1 (16.6±15.2)

5. Conclusions

A positive clinical response to antiparasitic therapy in 60.3% of RA patients infected with parasites indicates the role of helminths and *G. lamblia* in the development and course of RA and allows us to recommend parasitological examination as the first stage, and in case of detection of parasites, the mandatory appointment of antiparasitic therapy.

REFERENCES

- [1] Abdiev T.A., Karimova M.T., Umarova P.Kh., Yuldashkhodzhaev I.U., Ulmasov M.M. Situation on helminth-protozoal diseases in Uzbekistan // Doctor's Bulletin. - 2007. - No. 1. - S.75–76.
- [2] Latypov R. R. Comparative assessment of the effectiveness of certain anti-epidemic measures in relation to the main intestinal parasitoses among the rural population of the Ferghana Valley of the Republic of Uzbekistan. Abstract. Dis cand. ed. sciences. Tashkent. 2011. -23 p.

- [3] Sergiev V.P., Lobzin Yu.V., Kozlov S.S. Human parasitic diseases (protozoa and helminthiases). S.–Pb. Folio. 2016. -639 s.
- [4] Del Pozzo-Magana BR, Lazo-Langner A, Gutierrez-Castrellon P, Ruiz-Maldonado R. Common Dermatoses in Children Referred to a Specialized Pediatric Dermatology Service in Mexico: A Comparative Study between Two Decades. *ISRN Dermatol.* 2012; 2012: 351603.
- [5] El-Khateeb EA, Lotfi RA, AbdElaziz KM, El-Shiekh SE. Prevalences of skin diseases among primary schoolchildren in Damietta, Egypt. *Int J Dermatol.* 2014; 53(5): 609-16.
- [6] Givler DN, Givler A. Pityriasis, Alba. [Updated 2017 May 14]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. 2018.
- [7] Grills N, Grills C, Spelman T, Stooze M, Hellard M, El-Hayek C, Singh R. Prevalence survey of dermatological conditions in mountainous north India. *Int J Dermatol.* 2012; 51(5): 579-87.
- [8] Miazek N, Michalek I, Pawlowska-Kisiel M, Olszewska M, Rudnicka L. Pityriasis Alba--Common Disease, Enigmatic Entity: Up-to-Date Review of the Literature. *PediatrDermatol.* 2015; 32(6): 786-91.
- [9] Patel AB, Kubba R, Kubba A. Clinicopathological correlation of acquired hypopigmentary disorders. *Indian J Dermatol Venereol Leprol.* 2013; 79: 376-82.
- [10] Ritchie I.S., Pan C., Hunter G.W. A comparison of the zinc sulfate and the MGI (formalin ether) technics. // *J. Parasitol.* – 1952. – Vol. 38(4). - P. 16.
- [11] Silver ZA, Kaliappan SP, Samuel P, Venugopal S, Kang G, Sarkar R, Ajjampur SSR. Geographical distribution of soil transmitted helminths and the effects of community type in South Asia and South East Asia - A systematic review. *PLoS Negl Trop Dis.* 2018; 12(1): e0006153.
- [12] Uludag A, Kilic SO, Isik S, HaydarErtekin Y, Tekin M, Cevizci S et al. Prevalence of skin disorders in primary and secondary school age children in Canakkale, Turkey: a community-based survey. *Postepy Dermatol Alergol.* 2016; 33(3): 176-81.
- [13] Yamamah, G. A., Emam, H. M., Abdelhamid, M. F. et al. Epidemiologic study of dermatologic disorders among children in South Sinai, Egypt. *International Journal of Dermatology.* 2012; 51(10), 1180–1185.