

Detection of parasitic infections of the gastrointestinal tract in pediatric patients



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Introduction

- Endoparasitic infections of human gastrointestinal tract are currently one of the most pressing problems of health care systems in both developing and developed countries in the world. According to the World Health Organization, more than 1.2 billion people are infected with *Ascaris lumbricoides* and more than 795 million are infected with *Trichuris trichuria*.
- Transmission is associated with low personal hygiene.
- Prevalence of endoparasitic infections is closely related with poor social-economical status of the population with lower hygienic standard.
- Major part of parasitic infections is spread via fecal-oral route (**Fig.1**).
- Groups of population with higher risk of acquiring endoparasitic infections are children, pregnant women and immunocompromised patients.
- Manifestation of the infection depends on the development stage of the parasite and intensity of the infection.
- Heavy infection of gastrointestinal tract with parasites leads to malabsorption, diarrhoea, anemia, malnutrition, abdominal pain, fever, gastroenteritis and interruption of primary treatment. Intellectual retardation and slow growth can occur in children.

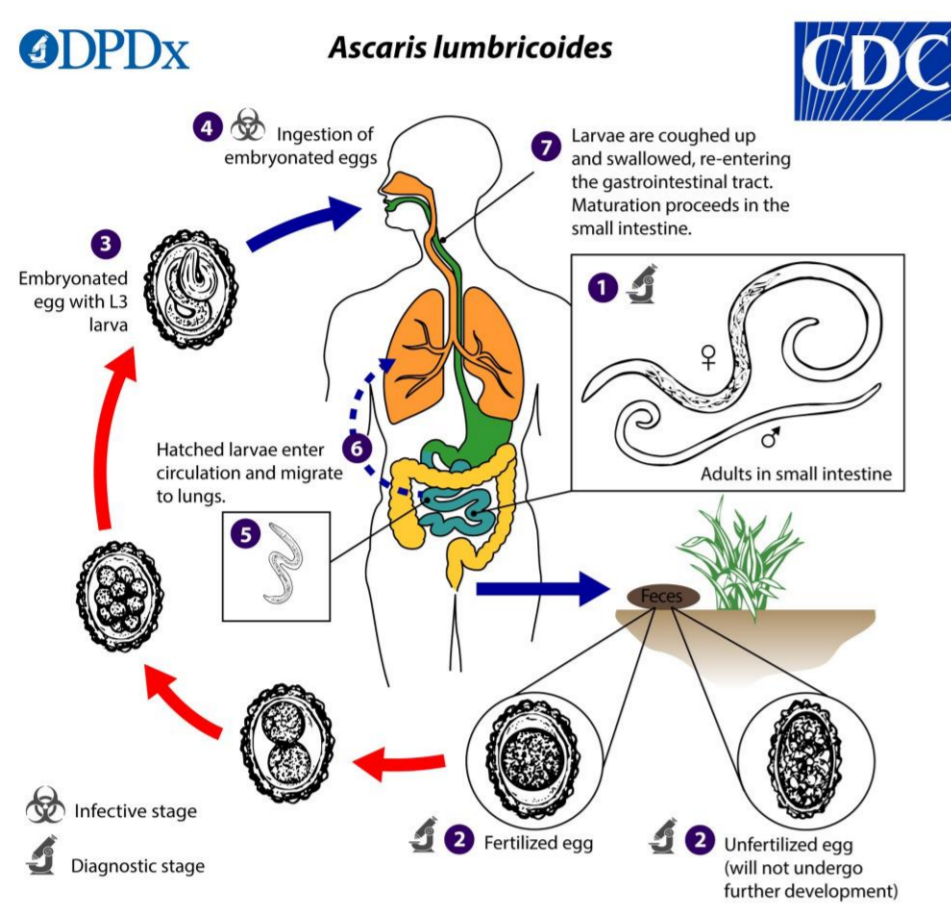


Fig. 1 Fecal- oral life cycle of *A. lumbricoides*

The aim of this study

- Determine the incidence of endoparasitic infections in children. Material and methods Study was carried out in faculty hospital for children in Košice (DFN Košice).

Patients

- Child patients visited the gastroenterological ambulance of DFN Košice or were hospitalized in gastroenterological department of DFN Košice.
- In total 150 patients (83 boys and 67 girls) were coprologically examined.
- Child patients were from 0 to 19 years old.
- To analyze endoparasitic infections we divided the patients into 5 age groups.
 - First group - children up to 2 years old (n=3)
 - Second group - from 3 to 5 years old (n=43)
 - Third group -from 6 to 10 years old (n=47)
 - Fourth group - from 11 to 15 years old (n=35)
 - Fifth group - from 16 and above (n=22).

Methods

- Samples of stool (approximately 10-15g of stool) were collected by parents or hospital personnel from all the child patients included in the study.
- Only properly labelled samples were included in the study.

Commercial kit was used for separation of parasites' eggs from stool samples (Paraprep L, Mondial, France) (Fig. 2).

1. Each sample contained 6 ml of 10% formalin in mixing chamber to which 0,5g of stool and 2ml of ethyl acetate solution were added.
2. 24 hour incubation in room temperature
3. Centrifugation (10 rpm, 1min),
4. Supernatant – removed.
5. Sediment – transferred to microscope slide.
6. Specimens were examined by light microscope Leica DM 5000b with magnification of 100x a 400x.



Fig.2 Part of commercial kit (test-tube)

Results

- From 150 stool samples examined 12 (8,0%) were positive on presence of intestinal parasites (**Fig. 3**).
- **Gender distribution of positive samples:**
 - 7 boys
 - 5 girls

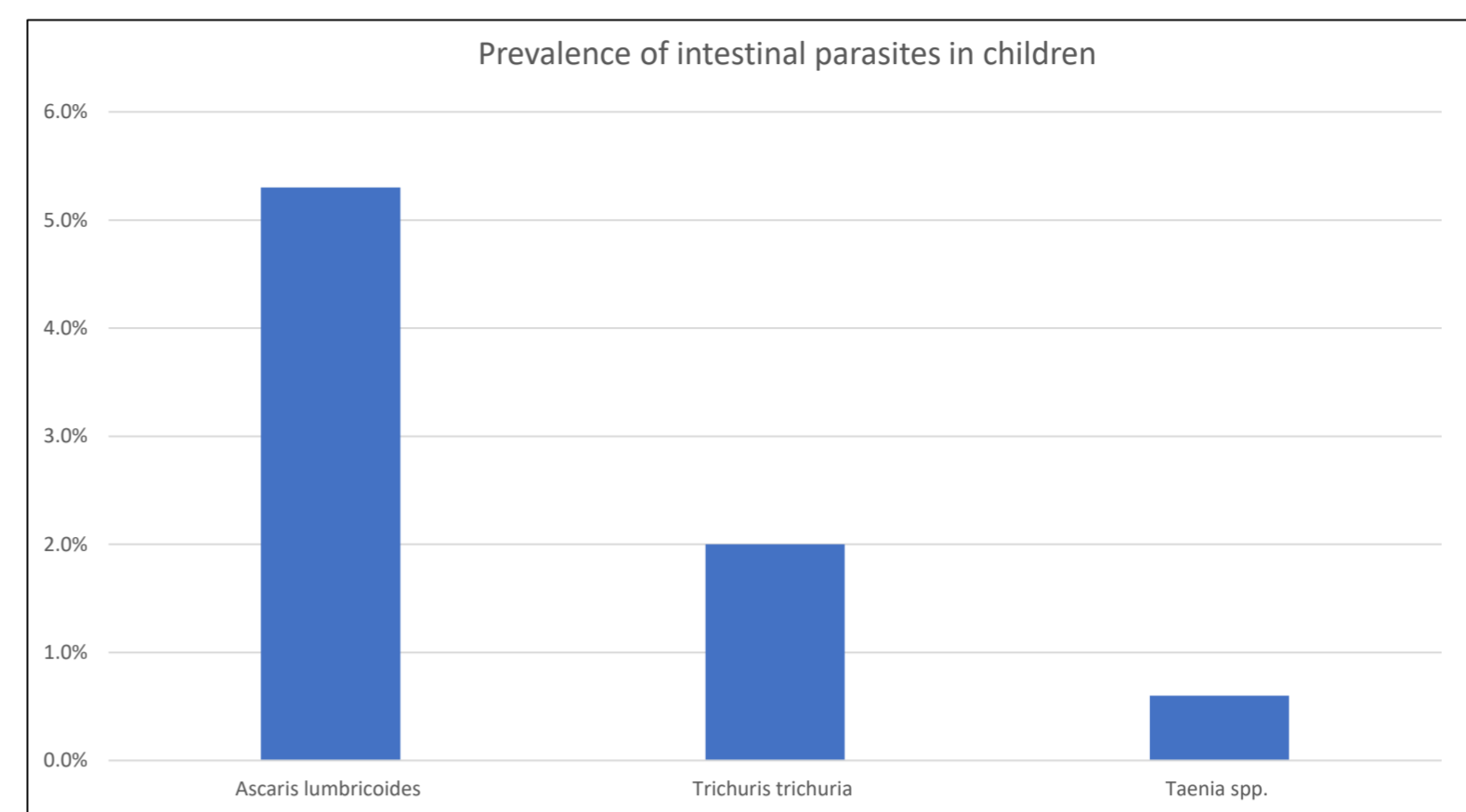


Fig.3 Prevalence of intestinal parasites species in samples

Ascaris lumbricoides

- Most commonly detected parasite in the samples (Fig. 3).
- Detected in two age groups (Fig. 4)
- Presence was detected in **8 samples (5,3%)**.
- Detected in **5 samples from boys and 3 from the girls**.

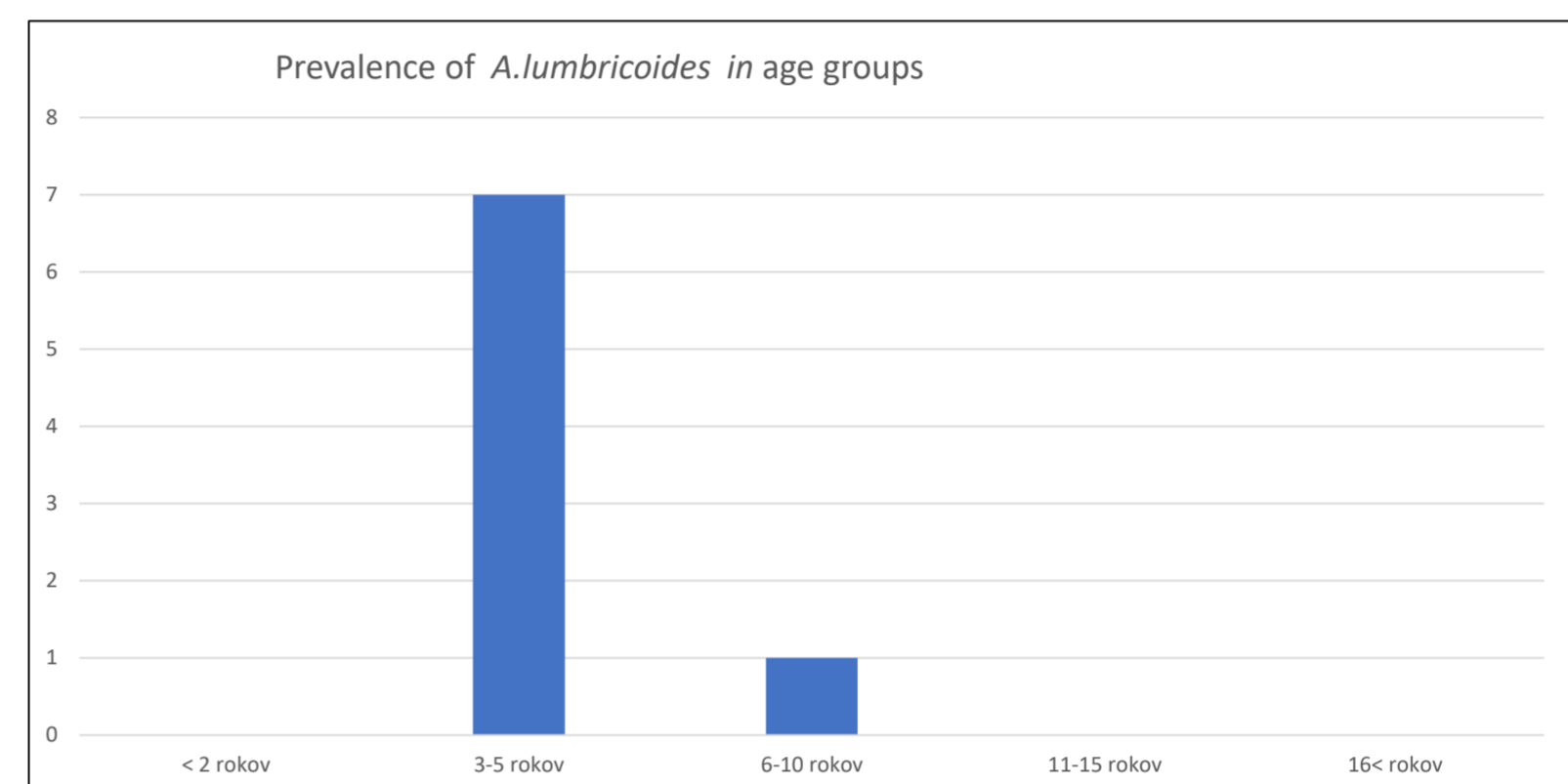


Fig.4 Prevalence of *A. lumbricoides* in age groups



Fig.5 Embryonated and Anembryonated eggs of *A. lumbricoides*

Trichuris trichuria

- It was second most common parasite in stool samples from children (Fig. 3).
- Detected in two age groups (Fig. 6)
- ***T. trichuria* was detected in 3 samples (2,0%)**.
- ***T. trichuria* was detected in 2 samples from boys and 1 from a girl**.

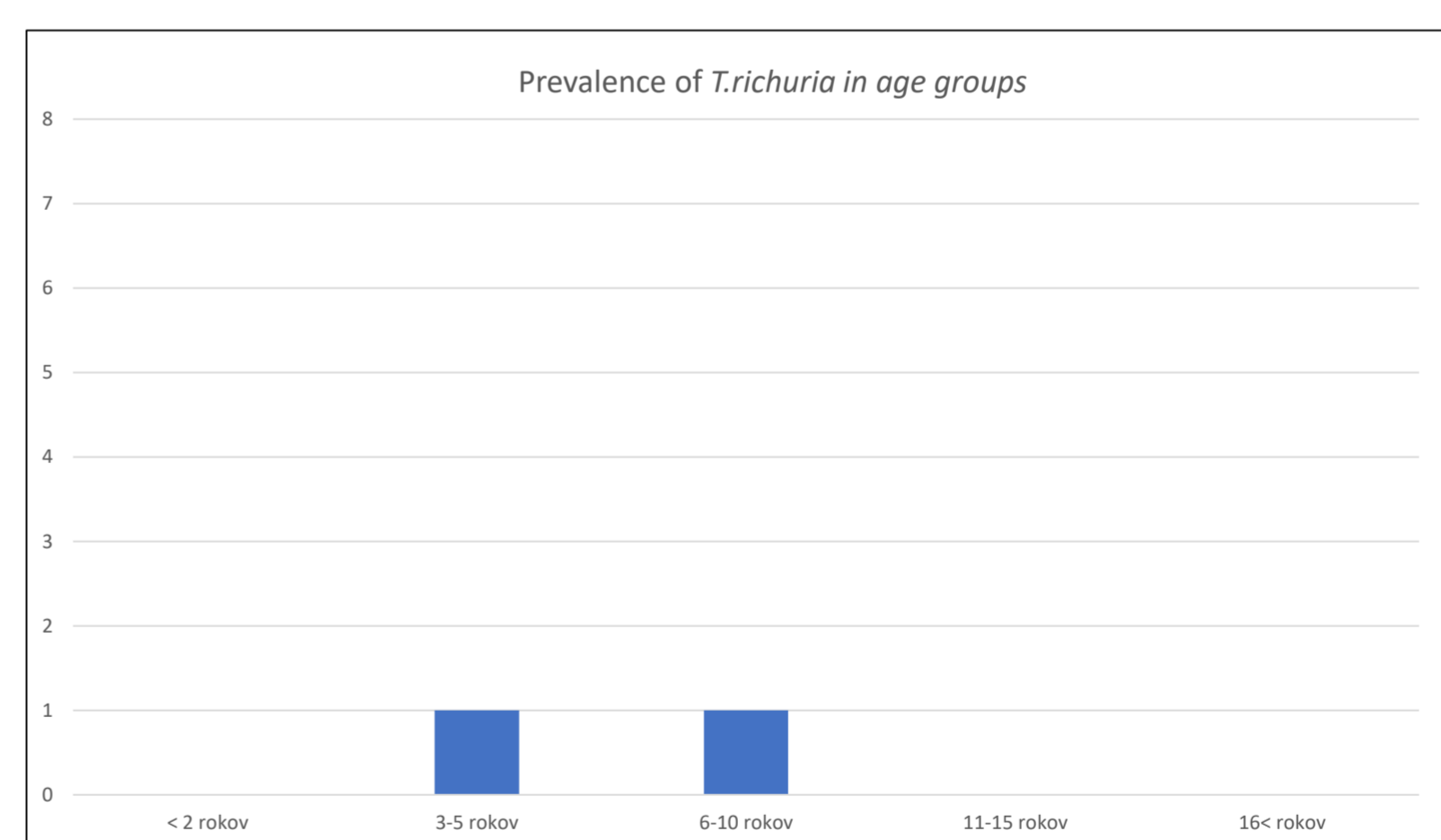


Fig.6 Prevalence of *T. trichuria* in age groups



Fig.7 Egg of *T. trichuria* in human stool

Other types of parasites

- Eggs of *Taenia spp.* were detected only in **one sample from 7 year old girl**.

Age group distribution

- Presence of parasite eggs was most often detected in **2nd age group** (children 3 to 5 years old) with **9 positive stool samples**.
- In **3rd age group (Children 6 to 10 years old) 2 positive stool samples were detected**.
- There were no positive samples in the remaining groups.

Conclusion

- Our study shows low prevalence of parasitic infections in the examined children.
- Highest prevalence of endoparasitic infections was detected in 2nd age group (children 3 to 5 years old).
- The most commonly detected gastrointestinal parasite was *A. lumbricoides* followed by *T. trichuria*.
- One of the reasons for low occurrence of parasitic infections can be the constant medical supervision and unlimited access to appropriate therapy of not only the primary affection but also of the associated infections in hospitalized patients.

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