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Intestinal Parasites in Children Collectives of Martin District, Czechoslovakia. A Comparative Study after 15 Years

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The data on prevalence of intestinal parasites of the population of Czechoslovakia are rather incomplete and the results of particular studies vary considerably in dependence on the age of examined and on several social and geographic factors (1, 5, 9, 10, 11, 12). Even if the present epidemiological situation in this field in Middle Europe does not create any burning problem, thanks to the temperate climatic zone we live in and a relative high social and sanitary standard of the population, the need of more data on intestinal parasites prevalence is strongly felt.

Neither the data provided by parasitological diagnostic centres nor the hospital data reflect the true picture of the prevalence of intestinal parasites in general population since they are concerned with sick people, often people with suspicion of parasitoses. One of the best ways of filling up this gap is preventive parasitological examination of the population as a whole and of its sections (representative samples).

In our experience the preschool and school children collectives suit best this purposes since they are easily accessible and they actually reflect the situation in children of the given geographic areas.

In 1970, we made the first step of preventive parasitologic examinations of children collectives of Martin District, Middle Slovakia, covering representative sample of children living in this area (9). In 1980, we made a second cross-section through the same children collectives, trying to answer the question "how the prevalence of intestinal parasites has changed after 15 years?" From this main question other accessory questions emerged:

- a) what are the basic trends of occurrence of particular intestinal parasites on different levels of children collectives?
- b) in which of them the spread of intestinal parasites is most intensive?
- c) can a general prognosis of these trends to the future be made in respect of the changing social and sanitary conditions?

Examined persons and methods

In our two-etape comparative study after 15 years (1970, 1985) we examined parasitologically altogether 6198 children of 21 day nurseries, 20 kindergartens and 14 primary schools (1st - 3rd form) of Martin District. The collectives were chosen so that they could represent population pf the studied area (villages from river basins, moun-tain valleys, urban and rural population etc.).

In both stages of the study we used the same laboratory methods — Graham-Brumpt's scotch-tape method for pin worm ova, Hein's and Faust's coprologic methods (2, 3, 4, 5, 6, 7). Taking of material and its laboratory examination was made in both stages by the same personnel. For statistical evaluation the chi²-test was used.

Results

Positivity rate of intestinal helminths in children collectives of Martin District after 15 years has dropped from 26.7% in 1970 to 21.4% in 1985 (diff. = 5.3%; $p < 0.001$), while the positivity rate of intestinal protozoa has increased from 8.7% in 1970 to 12.6% in 1985 (diff. = 3.9%; $p < 0.001$).

Positive findings of intestinal helminths and protozoa in children of day nurseries (up to 3 y.) are shown in Tab. 1.

Intestinal helminths:

After 15 years the percentage of *Enterobius vermicularis* slightly increased by 2.1% ($p > 0.05$); other helminths have not been found at all.

Intestinal protozoa:

After 15 years we have found the decrease of positive findings of *Giardia intestinalis* by 3.4% ($p > 0.05$); the findings of other protozoa were significantly increased.

Positive findings of intestinal helminths and protozoa in children of kindergartens (4 - 5 y.) are shown in Tab. 2.

TABLE 1
Intestinal helminths and protozoa in children of day nurseries
(Martin District, 1970, 1985)

HELMINTHS		E. VERMICUL.		A. LUMBRIC.		T. TRICHIURA		T. SAGINATA	
Year	No. Exam.	No.	%	No.	%	No.	%	No.	%
1970	726	62	8.5	2	0.28	9	1.24	1	0.14
1985	829	88	10.6	—	—	—	—	—	—
PROTOZOA		GIARDIA INTESTINALIS		ENTAMOEBIA COLI		ENDOLIMAX NANA			
Year	No. Exam.	No.	%	No.	%	No.	%		
1970	726	77	10.6	10	1.4	3	0.4		
1985	829	60	7.2	27	3.2	14	1.7		

TABLE 2
Intestinal helminths and protozoa in children of kindergartens
(Martin District, 1970, 1985)

HELMINTHS		E. VERMICUL.		A. LUMBRIC.		T. TRICHIURA			
Year	No. Exam.	No.	%	No.	%	No.	%		
1970	1014	245	24.2	6	0.6	23	2.3		
1985	1107	230	20.8	—	—	—	—		
PROTOZOA		GIARDIA INTESTINALIS		ENTAMOEBA COLI		ENDOLIMAX NANA			
Year	No. Exam.	No.	%	No.	%	No.	%		
1970	1014	40	3.9	6	0.6	3	0.3		
1985	1107	85	7.7	32	2.9	27	2.4		

TABLE 3
Intestinal helminths and protozoa in children of primary schools (1st - 3rd form)
(Martin District, 1970, 1985)

HELMINTHS		E. VERMICUL.		A. LUMBRIC.		T. TRICHIURA			
Year	No. Exam.	No.	%	No.	%	No.	%		
1970	1185	340	28.7	27	2.3	67	5.7		
1985	1337	373	27.9	2	0.14	7	0.52		
PROTOZOA		GIARDIA INTESTINALIS		ENTAMOEBA COLI		ENDOLIMAX NANA		ENTAMOEBA HISTOLYTICA	
Year	No. Exam.	No.	%	No.	%	No.	%	No.	%
1970	1185	80	6.8	33	2.8	3	0.25	—	—
1985	1337	90	6.7	49	3.7	29	2.2	1	0.07

Intestinal helminths:

After 15 years the percentage of *Enterobius vermicularis* has dropped by 3.4% ($p > 0.05$); similarly as in children of day nurseries, besides *Enterobius vermicularis* we have not found any other helminths in the second etape of investigation.

Intestinal protozoa:

After 15 years the positivity rate of *Giardia intestinalis* has almost doubled (3.9% or 7.7%, resp.), which means a significant increase ($p < 0.001$); the findings of other

intestinal protozoa were after 15 years significantly higher. Positive findings of intestinal helminths and protozoa in children of primary schools (1st-3rd form) are shown in Tab. 3.

Intestinal helminths:

After 15 years the positivity rate of *Enterobius vermicularis* remained practically the same, however, in both etapes of the study it was rather high (28.7% or 27.9%, resp.). Positive findings of other helminths were after 15 years significantly lower.

Intestinal protozoa:

After 15 years the findings of *Giardia intestinalis* were virtually the same (6.8% or 6.7%, resp.), while the findings of cysts of other intestinal protozoa were significantly increased. In the second etape of the study we have found cysts of *Entamoeba histolytica* in one symptomless pupil.

Discussion and conclusions

A cross-sectional prevalence study of intestinal parasites after 15 years has revealed some interesting findings.

First, the general decrease of prevalence of geohelminths, except *Enterobius vermicularis* which is transmitted also by direct interhuman way without the soil as a mediator of invasive ova. This most common parasitosis in our population showed after 15 years some oscillations in day nurseries children and in kindergarten children, however, in school children it remained in both etapes of the study on the same high level. Significant decrease was recorded in the prevalence of geohelminths *Ascaris lumbricoides* and *Trichuris trichiura*: in preschool children in the second etape of the study they have not been found at all and in school children their findings were only few. Their declining trend indicates that the steady sanitary situation of the population, detection of positives and their treatment are limiting factors for their spread.

The second interesting finding is a rather steep increase of prevalence of intestinal protozoa, mostly in older preschool children. We assume that collectivization of children of this age supports transmission of intestinal protozoa among them. Thus protozoan infections can be to some extent classified among the "civilization" parasitoses. However, this hypothesis requires further studies.

Analysing the generally high and not decreasing prevalence of enterobiosis and giardiasis in children of kindergartens and younger school children we arrived at the conclusion that parents of these children and personnel of the collectives do not devote sufficient attention to health education on basic sanitary habits, indispensable for breaking the transmission of these parasites in children collectives.

Thus we can conclude that in the control of intestinal parasitoses with direct interhuman transmission or with the spread by ova and cysts without soil as a mediator, more attention should be paid to personal hygiene and sanitary habits of children on kindergarten and school level and to create all the required technical conditions for their thorough realization (better maintenance and disinfection of the toilets, uninterrupted supply with toilet paper, soap and towels, supervision over hand-washing after using toilet etc.).

Summary

The authors compared prevalence of intestinal helminths and protozoa in children collectives of Martin District, Middle Slovakia, in the successive examinations after 15 years (1970, 1985).

They have found that the trend of geohelminthoses is decreasing, while the trend of intestinal protozoa is increasing.

In the control of intestinal parasitoses with direct, interhuman transmission — enterobiosis and giardiasis — they recommend measures in the field of personal hygiene of children of kindergartens and primary schools.

Key words

Children collectives of Martin District, intestinal helminths, intestinal protozoa.

Zusammenfassung

Darmparasiten bei Kindern des Bezirkes Martin/CSSR: Eine Vergleichsstudie.

Die Ergebnisse von zwei 15 Jahre auseinanderliegenden Bestimmungen der Häufigkeit von Darmparasiten bei Kindergruppen im politischen Bezirk Martin der Zentral-slowakei werden verglichen. Während das Geohelminthosenvorkommen fällt, steigt die Protozoenhäufigkeit.

Präventivmedizinische Vorschläge zur Kontrolle der interhuman übertragenen Parasiten, *Enterobius vermicularis* und *Giardia intestinalis*, werden erstellt.

Schlüsselwörter

Kindergruppen, Darmwürmer, Darmprotozoa.

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