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Enterobiasis and urinary tract infection

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The correlation between enterobiasis and urinary tract infection was studied in girls aged 6—14 years. Enterobius ova were demonstrated in anorectal scrapings, carried out three times in each case. Of the 84 patients suffering from urinary tract infection, 55 were Enterobius positive, as compared to 60 among 100 control girls. The difference was not significant. Enterobiasis was not found to be more frequent even when urinary tract infection reappeared within 6 months. There was no significant difference among patients with monosymptomatic bacteriuria and pyuria either. Enterobiasis thus seems to play no pathogenic role in urinary tract infection of girls.

A large proportion (20—80%) of children all over the world are infested with pinworm [2, 3, 5, 10] and it has been reported that children affected by urinary tract infection show a higher rate of enterobiasis than the average population [5, 7]. In view of the small number of reported cases it was felt justified to examine the relationship between the two conditions.

Patients and Methods

Eighty-four girls suffering from urinary tract infection were examined. Their age ranged from 6 to 14 years (average, 9 years and 7 months). The diagnosis of urinary tract infection was made if the freshly voided midstream urine, examined twice on consecutive days, contained more than 10^6 per ml of bacteria and the same bacteria could be cultured repeatedly from the urine; their antibiotic sensitivity had to coincide. Of the girls, 51 had pyuria; their urinary sediment contained more than 5 leukocytes per field. Thirty-three girls had monosymptomatic bacteriuria, and reinfection occurring within 6 months was observed in 37 patients.

Hundred girls aged 6 to 14 years (average, 9 years and 6 months) were examined as controls. These girls had no sign of urinary tract infection and no history of such complaints.

The diagnosis of enterobiasis rested on the presence of ova in the anal scrapings examined 3 times on consecutive days. Of infested persons, 90% are expected to give a positive result when examined in this way [10].

Enterobius ova were examined in anorectal scrapings, obtained by parting the cheeks and exposing the anal area. The short side of a laboratory slide was used for scraping both sides of the anus. If no material was obtained, the perianal area was wetted with a drop of water and the scraping repeated. The material thus obtained was transferred to a clean slide, smeared and examined under the microscope at ×70 magnification. The whole surface of the slide was screened as well

TABLE I

Comparison of the results of anorectal scraping and tape method in enterobiasis

Scraping	Tape method		Total
	Positive	Negative	
Positive	19	2	21
Negative	0	29	29
Total	19	31	50

TABLE II

Frequency of enterobiasis among girls with urinary tract infection and among controls

	Enterobius		Total
	Positive	Negative	
Urinary tract infection	55	29	84
Control	60	40	100
Total	115	69	184

as the edge of the one used to prepare the smear. In order to standardize results, all scrapings and examinations were carried out by the same person.

The procedure was compared to the generally used cellulose tape method [4]. In 50 cases the two methods were used simultaneously. Material was obtained from one side of the anus using the first method and from the other using the second method. Results are shown in Table I. It appears that the first method is at least as reliable as the tape method. Its advantages are that it is easier to obtain material, and the material collected from a larger surface area is concentrated in a smaller spot on the slide. Viewing the slides therefore takes less time. It is also easier, since with the tape method the pattern created by the adhesive and the curling up of the tape are somewhat disturbing for the examiner. On the other hand, transportation of the tape on slides is much simpler, and this is a considerable advantage if the material has to be sent to the laboratory.

RESULTS

Of the 84 girls affected with urinary tract infection, 55 were found to have Enterobious ova in the anorectal scrapings. In the control group, 60 had pinworm infestation. The difference was not significant ($\chi^2_{[1]}=0.5843$; $P > 0.3$; Table II).

Among the 37 girls who had reinfection, 24 had enterobiasis, while 31 were positive among the 47 who had had no reinfection. The difference was not significant ($\chi^2_{[1]} = 0.10985$; $P > 0.7$).

Of the 33 girls with monosymptomatic bacteriuria 19 were Enterobius positive, while of the 51 patients with pyuria 36 were positive. The difference was not significant ($\chi^2_{[1]} = 1.4114$; $P > 0.2$). There was no significant difference either if we compared the rate of Enterobius infestation among the patients with pyuria and the controls ($\chi^2_{[1]} = 1.093$; $P > 0.2$).

Discussion

There are two ways to explain the pathological role of enterobiasis in urinary tract infection of girls. According to the first view, the pinworms enter the urethra and the bladder carrying the bacteria of the gut [7]. Pinworms, however, are enteric parasites and rarely invade the organism outside the gut [1, 6, 9]. The number of such cases is extremely small if one takes into consideration that 209 million people in the world were said to be infected with Enterobius vermicularis [8], and the number of Enterobius infections in the USA is estimated at 42 million [10].

The other explanation seems more plausible: the worms cause perianal itching and the patient forces the bacteria into her urethra when scratching herself [5].

Reviewing the literature we found two papers claiming for enterobiasis a pathogenic role in urinary tract infection. Mayers and Purvis [5] found 10 positive cases among 26 girls with bacteriologically proven urinary tract infection, while 24 of the 100 controls were infested. If we analyse these data statistically, the difference was not significant ($\chi^2_{[1]} = 2.19$; $P > 0.1$). Of Simon's [7] 28 patients with urinary tract infection, 16 had enterobiasis, against 6 out of the 113 controls. As Welch [11] pointed out, the diagnosis of urinary tract infection in these cases was unequivocal: no bacteriological tests were carried out.

In the present material we found no correlation between either urinary tract infection and enterobiasis or between monosymptomatic bacteriuria, pyuria and enterobiasis. There was also a lack of correlation between pinworm infection and urinary tract reinfection.

Thus, according to our results, enterobiasis plays no pathogenic role in the urinary tract infection of girls.

Since completion of this paper, 35 new female patients suffering from urinary tract infection have been studied. Thus, of a total of 119 girls with urinary tract infection 80 had pinworms (67%) while in the control group of 120 patients 77 were positive for pinworms (64%). The difference was not significant ($x^2_{[1]} = 0.2482$; $P > 0.5$).

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