ASYMPTOMATIC BACTERIURIA IN SCHOOL CHILDREN: A PRELIMINARY STUDY.

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ABSTRACT

One hundred children in the age range of 7-13 years from Jiren primary and Junior Secondary School, in Jimma town,in May and June,1989 were studied by random sampling in order to detect asymptomatic (covert) bacteriuria. 3 different techniques were used; two direct microscopic studies and a standard culture method based on the KASS number. The study demonstrated that the boys were negative for bacteriuria but the prevalence rate in girls was found to be 4.3% . Higher frequency in the girls was at the age of 8 followed by the age group 11 years. The presence of bacteriuria in girls compared to that of the boys was considerable in the data set and the standard culture result was found to be better to the other two diagnostic techniques applied.

INTRODUCTION

Urinary tract infections are among the common infectious diseases (1). These infections are the causes of significant morbidity and mortality, and leave severe sequales as consequences of progressive renal infections (3).

Kunin and Rapkin (5) pointed out that about 5% of pediatrics patients treated in pediatrics clinics had urinary tract infections and was more frequent in girls than in boys of similar age, with the exception of the first year of life, (9) which showed three times higher frequency in

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female infants than that of the males (4). Nowadays, it is known that in this age group, the development of the kidneys achieve their maximum points so that it is necessary to detect the possible abnormalities in the urinary tracts in order to avoid later impairments of renal functions. This is done by routine screening of children for covert bacteriuria (1).

The introduction of bacteriological examination of urine and the development of other investigation techniques such as culture methods have permitted the identifications of covert bacteriuria in different groups of populations with useful epidemiological and diagnostic methods (6).

The purpose of identifying every asymptomatic bacteriuria is to discover lesions or structural abnormalities of the urinary tract which has to be corrected or treated early to avoid recurrent infections which may produce progressive renal failure (3).

As is cited in the above studies (7-9) there is a high predisposition of girls in the school ages to urinary tract infections with a greater proportion of recurrences. These findings motivated us to begin the bacteriologic and epidemiologic studies fo asymptomatic bacteriuria in school age children.

MATERIALS AND METHODS

One hundred school children between the ages of 7-13 years from Jiren Primary and Junior Secondary Schools were studied. Before starting the investigation, the aim of the study and the ways to obtaining clear mid-stream urine specimens were explained to school authorities and students respectively.

Urine sample was taken in the morning just after 8 AM on each day. All the specimens were taken by sterile wide-mouthed plastic specimen vessels with screw tap. The specimens obtained were cultured as soon as they were collected or within less than two hours of collection. For all the urine samples, wet smear, Gram-staining and culture on CLED agar was performed. The culture was inoculated with calibrated wire loops of 3mm in diameter and incubated at 37°C for 24 hours (4,6). Colony counter was used to identify and count the colonies grown on the media.

Urinary tract infection was defined if one of the following criteria is met:

A) a wet smear of urine sample revealing of more than 8 leacocytes/HPF.

B) a gram-stain revealing of pus cells and a single kind of bacteria in significant number, i.e., 10^5 bacteria/ml of urine.

C) in addition to presence of leucocytes in urine, a concentration of bacteria 10^5 or more/ ml of urine grown on culture media.

RESULTS AND DISCUSSION

The study was done on 100 school children of which 54 were males and 46 females. This comprised of 6.6% of the total school children. As shown in table 1, the over all positivity rate is 2%. The prevalence of asymptomatic bacteriuria in girls is found to be 4.3% with higher frequencies of 12.5% in the age 8 years and 6.6% in age 11 years. No positive cases were found from the boys.

TABLE 1

Prevalence of Covert Bacteriuria in School Children By Age And Sex (preliminary report) Jimma, Ethiopia (1989).

Age	No. of boys studies	No. of boys positive	preva-lence %	No. of girls studied	No. of girls postive	preva lance %
7	4	0	0	4	0	0
8	6	0	0	8	1	12.5
9	9	0	0	5	0	0
10	16	0	0	12	0	0
11	13	0	0	15	1	6.6
12	6	0	0	0	0	0
13	0	0	0	1	0	0
Total	54	0	0	46	2	4.3

TABLE 2

Comparision of Diagnostic Results for Covert Bacteruria Among 3 Techniques Employed.
Jimma Institute of Health Sciences (1989)

Technique	No. of cases positive	%	No. of cases Negative	%	Doubtful cases	%
Wet smear	2	2	92 *	92	3	3
Gram staining	2	2	95 **	95	0	0
Standard culture	2	2	98	98	0	0

* 3 cases were considered not useful for diagnosis.
** 1 case was considered not useful for diagnosis.

Our results are comparable to the results found by other investigators who pointed out that asymptomatic bacteriuria is a disease of the females with the exceptions in the first year of life (1-3).

Manalich (10) also found that a general prevalence in girls was around 1.1%. but he considered that this result was less than what was expected, and the higher frequency was in girls of 6 years of age. He didn't get any positive cases in boys

In our study, the 4.3% prevalence of asymptomatic bacteriuria in girls is similar to the results shown by other workers (9) as 5-6% of all girls with bacteriuria during the primary school age.

This reinforces the opinion that urinary tract infection is predominated in females. As shown in table 2; the different techniques applied included standard culture which is superior to the microscopic (wet smear and gram-staining) examinations. How-ever, the later two could be employed successfully with a narrow gap of differences if done by experienced personnel. As noted in the table it is seen that, there were two positive cases for both Gram staining and culture methods. But in the wet smear method, one positive result was proved to be negative by the culture technique. This could be contamination on the technical procedure.

CONCLUSION

The prevalence of covert bacteriuria in school children, i.e. 4.3% in girls in Jimma is similir to the other studies. The childhood covert bacteriuria could be due to different causes such as congenital abnormalities of the renal tract organs, neurogenic bladder, etc. Thus early detection of bacteriuria by screening of school children helps in correction & treating of the structural abnormalities and prevent recurrent urinary tract infections and their complications.

On this investigation, a lot of work remains to be done. We have the plan to continue with the work by selecting more sample size of sex and age groups in the area. In this report,the prevalence of covert bacteriuria in male school children is nil, thus, this needs further study.

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