

A PILOT STUDY ON THE PREVALENCE OF ASYMPTOMATIC BACILLURIA IN THE SCHOOL POPULATION OF ASSUIT

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Many screening procedures have been devised to demonstrate the significance of quantitative urinary bacterial counts and many writers have proved its importance by the satisfactory results obtained in the diagnosis of asymptomatic bacilluria in tested groups of children¹ and in pregnant women.²⁻⁸ In Virginia, in children of school age, Kunin et al⁹ found the incidence of asymptomatic bacilluria to be 1.1 % in girls and 0.04 % in boys; in Aberdeen, el-Garhy and Richardson¹⁰ found among their studied subjects 1.7 % in females and 0.6 % in males.

The aim of the present study is to describe the methodology used to establish the prevalence rate of asymptomatic bacilluria in a sample of a school population in the endeavor to furnish information for evaluating efficient prophylactic regimens.

Material and Method

The studied population was a sample of 3117 subjects (1732 female and 1385 male) derived from different schools of the city of Assuit, U. A. R., during the academic year 1966 who varied in age from six to 19 years. The age and sex of these children are shown in Table 1.

TABLE 1
SEX AND AGE OF CHILDREN IN STUDY

	6 - 12 years	13 - 15 years	16 - 19 years	Total
Male	378	252	755	1385
Female	408	357	967	1732
Total	786	609	1722	3117

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Special standardized cards were designed for the purpose of recording the personal data of the subjects' present or previous histories of urinary troubles. The instructions, which have been recommended by many writers,¹¹⁻¹³ were given for voiding a midstream specimen into the sterile containers provided. Any girl among the examined group who was menstruating was excluded from the study.

Each sample of urine was tested in the laboratory by the Griess Ilosvay nitrite test within three hours of the time of collection. Schaus and others¹⁴⁻¹⁶ have emphasized that a positive nitrite test for a sample of urine is associated with a colony count greater than 100,000 organisms per ml in 80 % of the cases of significant bacilluria. There were no false positives encountered in the test. A positive nitrite test was indicated by the appearance of a red colour within a few seconds by adding equal quantities of the examined urine to the nitrite reagent. In addition, the positive urine sample was confirmed by streaking a loopful of uncentrifuged urine on a Mac Conkey agar plate by a standardized 2 mm internal diameter loop¹⁷ which was found to discharge an inoculum of average size, 0.00176 ml. Calculation shows that urine containing 100,000 bacteria per ml should give a colony count of 176 and urine containing 10,000 bacteria per ml should give a colony count of 18.

A Gram-stained film was made directly from the urine samples provided to be examined microscopically for the presence of organisms, pus cells and other abnormalities. It is generally agreed that in a wet preparation the presence of five or more pus cells per high power field constitutes pyuria.¹⁸⁻²⁰ All subjects from whom positive urine samples were obtained for bacilluria were retested two weeks later. Proteinuria was searched for in all cases by albustix reagent strip and sulfosalicylic acid solution.

Results

Out of 3316 apparently healthy individuals approached in this study, 3117 cooperated (94 % response) and provided urine samples.

Among the 1732 girls examined, significant bacilluria was detected in 13 (three in the six to 12 age group, two in the 13 to 15 age group and eight in the 16 to 19 age group) with an overall prevalence rate of 0.7 %. Referring to age, the incidence was found to be 0.7 %, 0.6 % and 0.8 % in the age groups 6 - 12, 13 - 15, and 16 - 19 respectively. Two out of 13 girls with bacilluria also had albuminemia. Three girls (aged 12, 14 and 18) out of all the cases

who had bacilluria gave a history of frequency, dysuria and pain in the loins retrospectively.

Of the 1385 boys examined in this investigation whose ages varied from six to 19 years, only one boy aged 11 was affected with significant bacilluria, making an incidence of 0.07 %. The child had no complaints or previous history of urinary problems, but urine examination showed moderate albuminuria.

In this study, all cases found to be positive were discovered by the nitrite test. Furthermore, Gram's stained smears of uncentrifuged urine samples showed gram negative bacilli and the urine culture on MacConkey revealed profuse growth of *E. coli* with a count considered to be significant for bacilluria; moreover, the organism was sensitive to Furadantin^R (nitrofurantion). Pyuria was revealed in three subjects (two girls and one boy) among those found to be affected with bacilluria.

A retest was done on all positive cases two weeks after the first examination which revealed similar results. In a further follow-up, the affected persons were treated with adequate doses of Colifuran^{R*} for three successive weeks. In all of them negative cultures were obtained while they were on this treatment.

Discussion

The prevalence of bacilluria was found to be 0.7 % in females and 0.07 % in males among the 1732 girls and 1385 boys examined. The incidence in females seems to be slightly lower than that given by other authors.^{9, 10} This discrepancy in the results could be explained by the technical differences as well as by the number of subjects studied.

It is of epidemiological interest that all cases of significant bacilluria in this investigation were caused by *E. coli* and were found to be sensitive to Furadantin. This finding might help in any future prophylactic measures.

The evaluation of the potential use of some screening test techniques for the detection of asymptomatic bacilluria among school children should be assessed by long term study. It appears that the nitrite test has an advantage in that it requires little time to perform and is simple and inexpensive. Although there is still much

* Colifuran is a furadantin derivative from the Kahira Pharm. and Chem. Ind. Co., Cairo.

debate concerning its yield,¹⁰ its use might be considered in conditions where routine cultures are not available or in case of mass population study. It is obvious from the results of this investigation that a community screening program for the detection of asymptomatic bacilluria among school children can be readily performed at low cost with this method.

With regard to the follow-up study of positive cases with bacilluria, the writer suggests a complete urological investigation including intravenous pyelography and cystography. However, if full urological examination is not possible, treatment with an adequate antibiotic may be sufficient. These considerations are of great importance for eradication of early urinary infections which might cause other urinary abnormalities.^{8' 9' 18' 19}

In fact, the only difficulty encountered in this study occurred in obtaining a second sample of urine for retest from the examined subjects because they regarded the repeated sample as evidence of an abnormality. Such a difficulty could be overcome by more intensive educational health programs.

A major conclusion of this study is that future efforts to promote the use of screening techniques should be focused on a continuous study of the normal population, thus leading to early detection of asymptomatic conditions. In this way it is possible not only to cure such patients in an appropriate and timely way, but also to save them from dangerous complications.

Summary

The incidence of significant bacilluria was found to be 0.7 % out of 1732 girls and 0.07 % out of 1385 boys attending different schools in the city of Assuit, U.A.R., and varying in age from six to 19 years. All cases of bacilluria detected were caused by *E. coli* and were sensitive to Furadantin[®].

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