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# Communications

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## Screening for Asymptomatic Bacteriuria in a Disadvantaged School Population

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While bacteriuria in a schoolgirl seldom leads to endstage renal failure or hypertension, it is not an entirely benign condition. Asymptomatic bacteriuria may be the first clue to the existence of underlying anatomic abnormalities. In others it may signal the onset of recurrent symptomatic infections and a susceptibility to urinary tract infections during pregnancy.<sup>1</sup>

Investigators in the United Kingdom and Sweden<sup>2-4</sup> have questioned the need for the treatment of children with asymptomatic bacteriuria and have cast doubt on the value of screening large school populations. The objections raised were: (1) long-term treatment of asymptomatic bacteriuria has not decreased the occurrence of symptomatic infections; (2) eliminating a relatively innocuous strain of bacteria may predispose to infection with a more virulent organism; and (3) long-term therapy raises the possibility of adverse reactions to antibiotics.

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### Method

The community of Robbins in southwest Cook County, Illinois, has a population which is 98 percent black. Its residents have the lowest mean income in the state of Illinois and the highest percentage of residents receiving public assistance. The Posen-Robbins School Health Project, funded by the Robert Wood Johnson Foundation, was located in this community because of multiple demographic parameters indicating severe poverty and unsatisfactory living conditions.

The group screened in this study was the entire seventh grade pupil population. Permission was given by parents and patients, and specimens were collected during gymnasium class periods using the methods recommended by Kunin.<sup>5</sup> A total of 314 students participated, of whom 147 were males and 167 were females. All students ranged in age from 12 to 14 years. All specimens were tested, initially, with a dipstrip (N-UROSTIX) used to detect nitrite, glucose, and protein. For all students who had a positive finding in any or all of the areas of dipstrip detection cultures were done on two clean voided specimens.

### Results

Among the specimens provided by the male students, there were no positive tests for either



nitrite or glucose. Three of the specimens were positive for protein but none of the students proved to have significant bacteriuria on either of two clean voided specimens examined subsequently by culture. Growth on culture ranged from 10,000 to 25,000 colonies/ml among specimens obtained. One student who was found to have a persistent heavy proteinuria was diagnosed on subsequent evaluation as having orthostatic albuminuria. The other two male students had only transient proteinuria for which no cause was found.

Among the specimens voided by female students, 1 was positive for glucose (in a known juvenile-onset diabetic) and 15 were positive for protein by dipstick. Two were positive for nitrite only and one was positive for nitrite and protein. Eight of the female students were found to have a significant bacteriuria as demonstrated by colony counts over 100,000 colonies/ml on two subsequent clean voided cultured specimens. Six of the patients who had a growth of more than 100,000 colonies/ml had shown a positive reaction to protein only, one had been positive for nitrite and protein and one had been positive for nitrite only when urine was tested with dipstrip. All eight female students denied sexual activity; however, two were found to be pregnant while undergoing therapy.

The overall prevalence of asymptomatic bacteriuria in the seventh grade student population was 2.5 percent. The prevalence among female seventh grade students was 5.4 percent and the prevalence among male students was zero percent.

## Discussion

The results of this screening showed a higher than expected incidence of asymptomatic bacteriuria among schoolgirls while confirming its relative rarity among males of the same age. Most studies<sup>6,7</sup> have detected one to two percent of schoolgirls as having asymptomatic bacteriuria. The present study involved the screening of a relatively older junior high school population who were drawn largely from a disadvantaged population. Dodge and West<sup>8</sup> found an emergence of 4.6 percent in females, by the age of 12 years, on repeated screening. These children had not had access to primary care in the past. It has been suggested<sup>9</sup> that this type of population might yield

a higher percentage of positive results in screening.

In this study the nitrite indicator strip was less accurate than the detection of proteinuria when screening for asymptomatic bacteriuria. Previous studies<sup>10,11</sup> have arrived at the opposite conclusion.

It has been suggested<sup>12</sup> that the treatment of asymptomatic infection may precipitate symptomatic infection by different bacterial species to which the host has not developed "tolerance." This has not been the experience, thus far, among girls found to have asymptomatic bacteriuria in this study. All positive cultures among the eight girls with asymptomatic bacteriuria in this study grew *Escherichia coli*. During a six-month period of follow-up subsequent to a three-week course of sulfisoxazole, four of the patients have had sterile cultures. The other four patients have had persistent or recurrent bacteriuria due to *E coli*. It is not known whether the strains of *E coli* causing the infection have changed. All patients have remained asymptomatic; none developed symptomatic urosepsis. Compliance was ascertained by testimony from patients and/or caretakers. It has been quite difficult to achieve satisfactory compliance in extended therapeutic programs because of the lack of symptomatology and the unwillingness of some patients and parents to accept the need for therapy. This tendency has been reported by others.<sup>13</sup> The four patients with persistent or recurrent infection have shown no radiographic evidence of reflux or obstructive uropathy.

## Summary

In the Posen-Robbins School Health Project, 314 seventh grade students were screened for asymptomatic bacteriuria. A multiple dipstrip detection method was used for nitrite, glucose, and protein. Where one or more of the dipstrip tests was positive, urine cultures were performed on clean voided specimens. A child whose urine culture showed a colony count of greater than 100,000 colonies/ml was defined as having asymptomatic bacteriuria. Of the female students, 5.4 percent were found to have asymptomatic bacteriuria. None of the male students had asymptomatic bacteriuria. The percentage of schoolgirls in this age group who demonstrated infection was higher than previously reported. The school population screened in this study was from a poverty area



disadvantaged according to most demographic parameters.

### Acknowledgement

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# Effectiveness of Mailed Appointment Reminders

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Several controlled studies have shown that high "no show" rates can be significantly reduced by the use of patient reminder systems.<sup>1-3</sup> No show rates in these studies ranged from 20 to 60 percent prior to implementation of the systems, which reduced the rates to 9 to 30 percent. The most effective means of improving compliance has been by personal contact with patients using outreach workers.<sup>4</sup> Alpert found that lower no show rates may be anticipated in family oriented health centers, where comprehensive care is provided by a single practitioner for each family.<sup>5</sup> By contrast, higher rates are observed when care is rendered on an acute basis to low income populations by impersonal providers. Hagerman studied the impact in a university based family practice center of a

reminder mailed four to five days in advance of appointments.<sup>6</sup> The relatively low no show rate of 6 percent was lowered slightly but not significantly by reminders, to 3.6 percent. However, more cancellations were received from the mailed reminder group compared to controls (13.3 percent vs 6.5 percent) so that overall patient attendance was not increased.

In the Duke-Watts Family Medicine Center two problems relating to appointment keeping exist. The first is a no show rate of about eight percent among patients with scheduled return visits. The second problem is that patients who are asked by their physician to return in greater than two months time must be relied upon to self-schedule these remote appointments because of complexities in the provider scheduling system. They may fail to do so and thus become lost to follow-up. The purpose of this study is to determine the effect of mailed reminders on recalling patients who fail to keep scheduled appointments and on increasing the compliance with making and completing remote appointments.

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