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Percentage of Asymptomatic Bacteriuria among Primary School of Girls at Al-Najaf Govern in Iraq

Alaa Kamal Hussein[1*], Mustafa Jawad Talib[1], Basim Hadi Sahib[1] and Alaa Jumaah Manji Nasrawi[2]

1 Department of Pediatrics, Al-Zahraa Teaching Hospital for Maternity and Children, Najaf, Iraq.
2 Department of pediatrics, University of Kufa, Najaf, Iraq.

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ABSTRACT

Urinary tract infections (UTIs) are a common, potentially serious infection, especially in young children. UTIs occur in approximately 3-5% of girls and 1% of boys during childhood. Most of the UTIs in boys happen in the first year of life, whereas the age of the first diagnosed UTI in girls is highly variable. To determine the percentage of asymptomatic bacteriuria among school-aged girls in Al-Najaf city.

This prospective study was conducted in AL – -Zahraa Teaching Hospital for Maternity and Children in AL-Najaf City. A total of 400 primary school-aged girls were chosen from outpatient care. Each girl was sent for GUE, urine culture, and blood group. The name, age, residency, and time of toilet training were collected for each girl enrolled in this study. The SPSS program, version 19th, was performed using the T-test & chi-square.

This study included 400 school-aged girls in AL Najaf city, and the urine culture was positive (3%). The result of pyuria among them was (25%). From (72.25%) of girls in the first age group category (6-9) years, 3.1% positive urine culture and 2.25 % of the total number in this study and the second age group revealed that (27.75 %) of girls in (10-12) years category was 2.7% positive urine culture and 0.75 % from the total number. From (59.25%) of girls, the first group (urban area) had 2.1% positive urine culture and 1.25 % of the total number, and the second group revealed that among (40.75%) of girls from rural areas, 4.3% positive urine culture and 2.75% from the total number. Among (54%) of girls of early age toilet training (2-3) years 4.9%positive urine culture and 2.5% of the total number in this study, and the second group revealed that among (46%) of girls in late age group of toilet training (>3)year category was 1.1% positive urine culture and0.5% from total number. The results of positive urine culture showed that E-coli was found in(75%) of positive urine cultures, Klebsiella was found in (16.6%), and Proteus in (8.33%).

The study concluded that asymptomatic bacteriuria was 3% between 6 and 9 years, and E. coli was considered the most common microorganism causing positive urine culture.

Corresponding Author:

* Alaa Jumaah Manji Nasrawi
Professor, department of pediatrics, University of Kufa, Najaf, Iraq.
alaaj.nasrawi@uokufa.edu.iq

1- INTRODUCTION

When bacteria are found in urine without any outward indications of a urinary infection in the patient, this is known as asymptomatic bacteriuria. In two consecutive urine specimens, the microbiologic definition is often higher than or equivalent to 105 colony-forming units per milliliter of the same organism or organisms. Varied groups have asymptomatic bacteriuria at varied rates and with varying natural histories [1]. Since the quantitative urine culture became widely used as a dependable method of identification, there has been debate on the clinical significance of asymptomatic bacteriuria [2]. The primary query is whether bacteriuria causes urinary infection problems when there are no symptoms [3]. Short-term consequences like pyelonephritis or a lower tract infection [4] and longer-term issues including urolithiasis, genitourinary cancer [5], renal failure [6], hypertension [7], and mortality have been identified as adverse outcomes of concern [8]. Conversely, bacteriuria without symptoms might be advantageous. Through competition for resources or receptor sites, induction of a cross-protective host immunological or inflammatory response, or other mechanisms, colonization of the genitourinary tract by a pathogenic bacterium may prevent infection with more virulent pathogens [9]. After germs climb the urethra and enter the bladder, asymptomatic bacteriuria occurs, occasionally with later ascendance to the kidneys. The bacteria that are recovered from the urine of people who have asymptomatic bacteriuria typically start as gut, vaginal, or perineal colonizing flora. It is possible for bacteria that contaminate urologic tools or fluids to enter the genitourinary tract of patients undergoing urinary tract instrumentation without first colonizing the host. After that, the organisms continue to exist in the urinary system without causing a host reaction strong enough to generate symptoms or eradicate them. Persistence may be aided by inadequate bladder emptying, the presence of a foreign body, or host genetic predisposition [10, 11]. The most common bacterium found in individuals with asymptomatic bacteriuria is Escherichia coli [12].

Acute morbidity and long-term consequences, such as hypertension and reduced renal function, are caused by urinary tract infections. A proper diagnosis of a UTI is essential for ensuring adequate assessment and follow-up and facilitating effective care of the acute illness. Accurately ruling out a UTI is equally critical to prevent needless, expensive, and sometimes hazardous investigation and treatment [13, 14].

The aim of the study was to evaluate the percentage of asymptomatic bacteriuria among school-aged girls in Al-Najaf city.

2- MATERIALS AND METHODS

This prospective study was conducted in AL Zahraa Teaching Hospital for Maternity and Children in AL Najaf city from October 1, 2023, to October 1, 2024. A total of 400 primary school-aged girls were chosen from outpatients at AL-Zahraa Teaching Hospital. Verbal Consent was obtained from each girl's parents. Each girl was sent for GUE, urine culture, and blood group.

The following data were collected for each girl enrolled in this study: Name, Age, Residency and Age or Time of toilet training.

Exclusion criteria:

1- Obvious clinical evidence of UTI.
2- Antibiotic use during the last two weeks.

The urine sample was collected by midstream urine after cleaning the perineum in the female with water; the labia should be spread manually to avoid contamination, and urine should be collected in sterile wide-mouth bottles. Then, the samples were sent to the lab within half an hour.

Statistical analysis: Statistical analysis was done using SPSS program version 19th; data were expressed, and comparisons of proportions were performed using the T-test & chi-square. A P-value of ≤ 0.05 was considered statistically significant, a P-value of <0.01 was substantial, and a P-value of <0.001 was significant.

3- RESULTS

Urine culture was positive in twelve girls out of four hundred school-aged girls (3%) in Al-Najaf city, as shown in Figure (1).

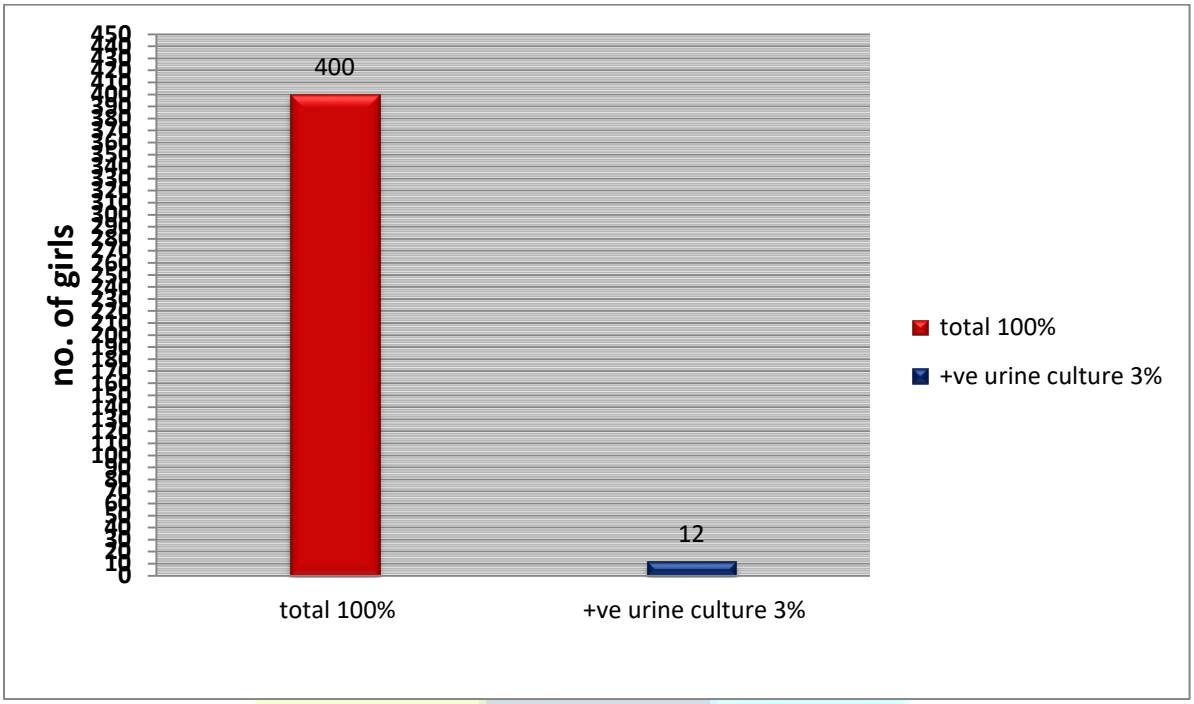

Figure (1) revealed positive urine culture among (400) school-aged girls in Al-Najaf city.

The result of pyuria among twelve positive urine cultures was three (25%), as shown in Figure (2).

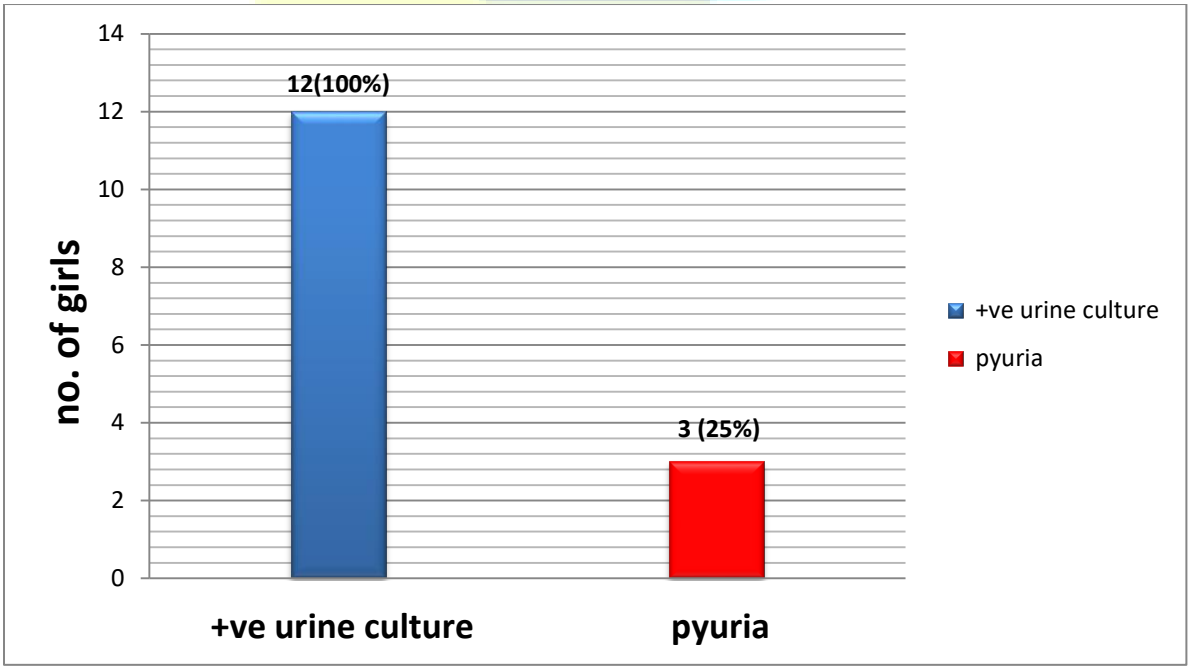

Figure (2) revealed pyuria among positive urine cultures of asymptomatic bacteriuria.

Table (1) revealed that among 289 (72.25%) girls in 0f first age group category (6-9) years, nine positive urine cultures which constituted 3.1% of positive urine cultures and 2.25% of total number in this study and the second age group revealed that among 111 (27.75%) girls of (10-12) years category, three positive urine culture which constituted 2.7% from positive urine culture and 0.75% from total number, p-value was 0.017.

Table (1) the association between positive urine culture and age groups.

Age (year)	No.(% of total)	+ve urine culture No. (%)	P-value
6- 9	289 (72.25%)	9 (3.1%)	0.017
10-12	111 (27.75%)	3 (2.7%)	
total	400 (100%)	12	

Table (2) revealed that among 237 (59.25%) girls of the first group (urban area) category, five positive urine cultures constituted 2.1% of positive urine cultures and 1.25 % of the total number in this study. The second group revealed that among 163 (40.75%) girls from the rural area category, seven positive urine cultures constituted 4.3% and 2.75% of the total positive urine cultures. The p-value was 0.015.

Table (2) the association between positive urine culture and residency.

Residency	No.(% of total)	+ve urine culture No. (%)	P-value
Urban area	237(59.25%)	5 (2.1%)	0.015
Rural area	163(40.75%)	7 (4.3%)	
total	400(100%)	12	

Table (3) revealed that among 216 (54%) girls of early age toilet training (2-3) year category, 10 positive urine cultures, which constituted 4.9% of positive urine cultures and 2.5% of the total number in this study and the second group revealed that among 184 (46%) girls of late age group of toilet training (>3)year category, tow positive urine culture which constituted 1.1% from positive urine culture and 0.5% from the total number, p-value was 0.003.

Table (3) the association of positive urine culture and age of toilet training among girls.

Age of toilet training(year)	No.(% of total)	+ve urine culture No. (%)	P-value
2-3	216 (54%)	10 (4.9%)	0.003
>3	184 (46%)	2 (1.1%)	
Total	400 (100%)	12	

Table (4) revealed that in the 1st group, among 108 (27 %) girls of blood group A category, two positive urine cultures constituted 1.85% of positive urine cultures and 0.5% of the total number. In the 2nd group, among 114 (28.5%) girls of blood group B category, three positive urine cultures constituted 2.63% from positive urine culture and 0.75% of the total number. In the 3rd group, 32 (8 %) girls of blood group AB category had no positive urine culture, which constituted 0 % of positive urine culture and 0 % of the total number. In the 4th group, among 146 (36.5%) girls of blood group O category, seven positive urine cultures constituted 4.79 % of and 1.75 % of the total number, with- a value of 0.002.

Table (4) shows the association between positive urine culture and blood groups.

Blood group	No.(% of total)	+ve urine culture No.(%)	P-value
A	108 (27%)	2 (1.85%)	0.002
B	114 (28.5%)	3 (2.63%)	
AB	32 (8%)	0 (0)	
O	146 (36.5%)	7 (4.79%)	
Total	400 (100%)	12	

The results of positive urine culture show that E. coli was found in 9(75%) positive urine cultures, Klebsiella was found in 2 (16.6%), and Proteus was found in 1 (8.33%), as shown in Table (5).

Table (5) shows the number and percentage of isolated microorganisms from positive urine culture of asymptomatic bacteriuria.

M.O. isolated	Total no.	%
Escherichia coli	9	75%
Klebsiella spp.	2	16.6%
Proteus spp.	1	8.33%
total	12	100%

4- DISCUSSION

This study noted that the percentage of significant asymptomatic bacteriuria among school-aged girls was 3%, as shown in Figure (1). It is difficult to compare the results of this study with the results of others using different culture methods, different methods of urine collection, and a more significant number of girls. Still, this result was higher than those of both kunin [15] 1.1% in the U.S.A, Iitaka [16] in the Japanese study (0.52%), Zainal [17] in Malaysia (0.18%) and also higher than study in Newcastle [18] (1.9%). In comparison, it was lower than that study in India (10.2%) [19].

The current study reported that there is a significant association between asymptomatic bacteriuria and age group (6-9) year,(9/289), (3.1%), p-value was (0.017), while the study in Newcastle [18] show that significant association with age group (7 – 11) years and in Japanese [16] study noted that, there was no difference in the prevalence of asymptomatic bacteriuria between primary and junior high school children. Our result may be poor hygiene, improper wiping from back to front during washing, and probable hidden congenital anomalies in this age group [20].

In this study, the results showed that there was a significant association between asymptomatic bacteriuria and rural area (7/163), (4.3%), the p-value was (0.015) while in the study of Newcastle [18] show that no association between asymptomatic bacteriuria and between different social class. The result of this study may be due to poor hygiene, low socioeconomic status, and cultural education.

The study also shown that there was a highly significant association of asymptomatic bacteriuria with the early age group of toilet training (10/216), (4.9%), the p-value was (0.003). This result may be because the young children may hold their urine and bowel motions due to pressure to toilet training too early or may have inadequate potty training followed up by their families. At the early age of toilet training, the family may leave the girl to depend on herself too early, which leads to washing mistakes that may continue to early age school without observation.

In this study the positive urine culture was more common in girls with blood group O, (7/146), (4.79%), the p-value was (0.002), and there were many studies around the association between UTI and blood group like study in Turkey [21] show that association between UTI and blood group A and in Iran [22] association between UTI and blood group O and B. In this study, E-coli were the most common microorganism isolated from the positive urine culture, forming about (75%). This result was consist with that has been obtained in India [19] (32.8%), Malaysia [17] (28.75%), and Newcastle [18] (91.7%). This study revealed that pyuria was present in (25%) positive urine cultures, as shown in Figure (2). This result is low compared to the result obtained by Kunin et al [15] (43%) in school-aged girls. This result indicated that asymptomatic bacteriuria may be present with pyuria as a local response to asymptomatic bacteria in urine [23, 24].

In a similar study by Al Hares et al [25], the prevalence of UTIs in children was investigated. This highlighted the importance of early detection and management of asymptomatic bacteriuria in pediatric populations. This aligns with our findings, emphasizing the need for improved hygiene practices and early intervention to prevent complications associated with UTIs.

5- CONCLUSION and RECOMMENDATION

The percentage of asymptomatic bacteriuria was 3%, and it increased between 6-9 years in rural areas, during early toilet training, and in blood group O, where E. coli was considered the most common M.O cause of positive urine culture**.**

From the results of this study, the following can be recomnded:

1) Encourage the families to avoid pressure on their children to start toilet training early and teach them the ideal washing method with observation for good hygiene**.**
2) A large study sample, including different geographical areas, is recommended.
3) More studies are needed to determine whether asymptomatic bacteriuria is a risk factor for symptomatic UTI in school-age girls and whether treatment benefits them.
4) Improve laboratory work in hospitals, especially urine culture (by colony count), to make the detection of UTIs more accurate and effortless.

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نسبة البيلة الجرثومية عديمة الأعراض بين الفتيات في سن المدرسة الابتدائية في مدينة النجف

الخلاصة

التهابات المسالك البولية (UTIs) هي عدوى شائعة وقد تكون خطيرة، خاصة عند الأطفال الصغار. تحدث التهابات المسالك البولية لدى حوالي ٣-٥٪ من الفتيات و١٪ من الأولاد خلال فترة الطفولة. معظم حالات التهاب المسالك البولية عند الأولاد تحدث خلال السنة الأولى من العمر، بينما يختلف عمر التشخيص الأول لالتهاب المسالك البولية عند الفتيات بشكل كبير.

تم تحديد نسبة البيلة الجرثومية عديمة الأعراض بين الفتيات في سن المدرسة في مدينة النجف:

أجريت هذه الدراسة الاستباقية في مستشفى الزهراء التعليمي للأمومة والأطفال في مدينة النجف. تم اختيار ٤٠٠ فتاة في سن المدرسة الابتدائية من العيادات الخارجية. تم إجراء تحليل البول العام(GUE) ، وزرع البول، وفحص فصيلة الدم لكل فتاة. تم جمع بيانات تتضمن الاسم، العمر، مكان السكن، ووقت التدريب على استخدام المرحاض لكل فتاة مشاركة في الدراسة. تم تحليل البيانات باستخدام برنامج SPSS الإصدار ١٩، حيث تم تطبيق اختبار (T-test) واختبار مربع كاي (Chi-square) .

شملت هذه الدراسة ٤٠٠ فتاة في سن المدرسة في مدينة النجف، وكانت نتائج زراعة البول إيجابية بنسبة (٣%). بينما بلغت نسبة تواجد القيح في البول (٢٥%). من الفتيات اللواتي تتراوح أعمارهن بين (٦-٩) سنوات، ويمثلن (٧٢,٢٥%) من العينة، كانت نتيجة زراعة البول إيجابية بنسبة (٣,١%) أي (٢,٢٥%) من إجمالي العينة. أما الفئة العمرية الثانية (١٠-١٢ سنة)، والتي تمثل (٢٧,٧٥%) من العينة، فقد بلغت نسبة زراعة البول الإيجابية (٢,٧%) أي (٠,٧٥%) من إجمالي العينة.

أما فيما يتعلق بالسكن، فقد كانت نسبة الفتيات من المناطق الحضرية (٥٩,٢٥%) منهن كانت زراعة البول إيجابية بنسبة (٢,١%) أي (١,٢٥%) من إجمالي العينة، بينما كانت نسبة الفتيات من المناطق الريفية (٤٠,٧٥%) وكانت نسبة زراعة البول الإيجابية بينهن (٤,٣%) أي (٢,٧٥%) من إجمالي العينة.

أما فيما يخص عمر التدريب على استخدام المرحاض، فقد بلغت نسبة الفتيات اللواتي تلقين التدريب في سن مبكرة (٢-٣ سنوات) (٥٤%)، وكانت نتيجة زراعة البول إيجابية بنسبة (٤,٩%) أي (٢,٥%) من إجمالي العينة. بينما بلغت نسبة الفتيات اللواتي تلقين التدريب في سن متأخرة (3< سنوات) (٤٦%)، وكانت نتيجة زراعة البول إيجابية بنسبة (١,١%) أي (٠,٥%) من إجمالي العينة.

بالنسبة لأنواع البكتيريا التي تم عزلها، فقد كانت **الإشريكية القولونية (E. coli)** هي الأكثر شيوعاً بنسبة (٧٥%) من العينات الإيجابية، تلتها **الكلبسيلا (Klebsiella)** بنسبة (١٦,٦%)، ثم **البروتيوس (Proteus)** بنسبة (8.33%) .

يستنتج من هذة الدراسة أن نسبة البيلة الجرثومية عديمة الأعراض قد بلغت (٣%) بين الفتيات اللواتي تتراوح أعمارهن بين ٦ و٩ سنوات، وكانت **الإشريكية القولونية (E. coli)** هي الكائن الدقيق الأكثر شيوعاً المسبب لنتائج زراعة البول الإيجابية.