

Original article

Prevalence of asymptomatic bacteriuria in elderly referred to outpatient clinics in Talegani hospital, Abadan, Iran

Ahmad Farajzadeh Sheikh,
PhD¹

Nabi Jomehzadeh, MSc¹

Mansur Amin, PhD¹

Ali Asadi Rad, DVM²

¹Department of Medical Microbiology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

²Faculty of Veterinary Medicine, Shahid Chamran University, Ahvaz, Iran

Address for correspondence:

Dr. Mansur Amin, Department of Medical Microbiology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Tel: +98611 3738191

Fax: +98611 3332036

Email: mnsamin@yahoo.com

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Abstract

Introduction and objective: Asymptomatic bacteriuria (ASB) is the presence of significant numbers ($\geq 10^5$ CFU/ml) of bacteria in the urine accompanying. The occurrence of ASB is widespread among elderly population. This study detected the prevalence of ASB in the elderly referred to the Taleghani hospital in Abadan, Iran.

Materials and methods: A total of 265 outpatients female and male aged between 60-90 years old who attended of Taleghani hospital in Abadan south western of Iran with no dysuria, frequency and urgency, fever, chills and flank pain, and were screened by collecting mid-stream urine samples for identification of the asymptomatic bacteriuria. The bacteria were isolated and disk diffusion method was used to study their patterns of antibacterial susceptibility.

Results: Asymptomatic bacteriuria was observed in 10.9% cases with predominant prevalence in female. A total of 29 isolated bacteria, *Staphylococcus saprophyticus* was considered as the most frequent organism which was accountable for 34.5% of the cases of ASB, and followed by *Escherichia coli* (31%), *Klebsiella pneumoniae* (17.2%), *Proteus mirabilis* (6.9%), *S. aureus* (6.9%) and *Pseudomonas aeruginosa* (3.4%). The resistance of the isolated bacteria to cephalotin and nitrofurantion were 78.3 and 69.1%, respectively. Most of the bacteria were sensitive to cefixime and ofloxacin.

Conclusion: Nearly 11% of elderly person were identified to suffer from asymptomatic bacteriuria, and *S. saprophyticus* was a common pathogen.

Significance and impact of the study: The elderly over 60 years has substantial risk of suffering from ASB, therefore they indispensable an accidental perform usual urine culture.

Keywords: Asymptomatic bacteriuria; *Staphylococcus saprophyticus*; *Escherichia coli*; *Klebsiella pneumoniae*

Introduction

Asymptomatic bacteriuria (ASB) is the presence of bacteria in urine without urinary symptoms. This occurrence is one of the important diseases in elderly people. It is stated that the rate of bacteriuria increases with age, so much that it increases 1-2% each 10 years [1]. The prevalence rate of ASB ranges from 5 to 21% and was reported in population over the age of 65 [2]. It rises with increasing age up to 40% in males and 50%, in females [3]. The majority of prevalence of ASB with predominance in female was reported by a number of investigators [4-7].

The sources of causative bacteria of this disease are commonly originated as colonizing normal flora of the urogenital, gut and perineum region. The *Escherichia coli* (75% to 80%) was stated as the majority of bacteria that are isolated from the elderly asymptomatic bacteriuria [4,8] and others isolated include *Klebsiella pneumoniae*, *Enterococcus* species, coagulase-negative staphylococci, group B streptococci, and *Gardnerella vaginalis* [3]. There are a few reports that have focused on the elderly living in community settings. This study was performed to report the prevalence, causative bacterial agents, and antibacterial susceptibility resistant pattern of ASB in the elderly people who lived in community setting in Abadan, Iran.

Materials and methods

A descriptive cross-sectional study was performed on 265 elderly females and males living in community, aged between 60-90 years old who attended the Abadan Taleghani hospital, in the south west of Iran. Clinical symptoms of urinary tract infections (UTI) including: dysuria, frequency and urgency, fever, chills and flank pain were not observed in any study cases. All cases were divided into three groups: in the first group people aged 60-

70, in the second they were aged 71-80, and in the third group, they were between 81-90 years old.

Urine specimens were collected by the mid-stream urine method. The samples were cultured on Blood agar (Merck, Germany) and McConkey agar (Merck, Germany) by using the quantitative loop technique within the maximum of two hours after collection. After overnight incubation at 37°C and aerobic condition, if colonies count appeared to be $\geq 10^5$ CFU/ml, it stated as proven ASB [3]. The bacteria identified and isolated by Gram staining, catalase, tube coagulase, oxidase, nitrate tests, and novobiocin examination and other biochemical standard tests [9].

The antibacterial susceptibility patterns were performed by disk diffusion method (Kirby Bauer's technique). According to 0.5 McFarland, the turbidity of each isolated bacteria were prepared and cultured on Muller Hinton agar (Merck, Germany). Growth inhibition zone was measured around the disks after incubated for 24h at 37°C, according to guidelines published by the NCCLS [10].

Results

Based on the assessment of 265 elderly males (n=130) and females (n=135) ranged 60-90 years old, none had any clinical symptoms of UTI. 29(10.9%) cases had proven asymptomatic bacteriuria, of which 19(65.5%) were observed in elderly women and 10(34.5%) cases in elderly men. The majority of bacteriuria was observed in the people aged 60-70 years group (55.1%) with 68.8% predominately in women. The lowest frequency of ASB was found in group three.

The frequency of ASB according to age and sex were shown in table 1. A total of 29 isolated bacteria from urine culture, *Staphylococcus saprophyticus* 10(34.5%) considered as the majority causative agents

of bacteriuria in elderly cases, and followed by *E. coli* 9(31%), *K. pneumoniae* 5(17.2%), *Proteus mirabilis* 2(6.9%), *S. aureus* 2(6.9%), and *Pseudomonas aeruginosa* 1(3.4%) in both sexes. The result of antibacterial susceptibility pattern of isolated bacteria from ASB showed that 78.3% of bacteria are resistant to cephalothin and 69.1% showed resistance to nitrofurantoin. In contrast, 84.3% and 72.9% of isolated bacteria were sensitive to cefixime and ofloxacin, respectively.

Table 1: Frequency of proven ASB according age and sex in elderly cases

Age groups years	Female No (%)	Male No (%)	Total No (%)
60-70	11(68.8)	5 (31.2)	16 (55.2)
71-80	6 (60)	4 (40)	10(34.5)
81-90	2 (66.7)	1(33.3)	3(10.3)
Total	19(65.5)	10 (34.5)	29 (100)

Discussion

Asymptomatic bacteriuria is one of common disease in the elderly population. It is reported as a major risk factor for the development of UTI [11]. The prevalence of ASB varied between 15 up to 50% that is related to sex and progresses with increasing the age [12-14]. The elderly, who residing in care facilities, more commonly have ASB than the community population. It was shown that 25-50% of female and 15-40% of male living in care facilities had ASB [3], whereas this rates in elderly female and male outside of the nursing home were 10.8-16% and 3.6-19%, respectively [3].

Several reports showed that the rate of ASB incidence is increased 1-2% each 10 year [1,3]. Also, in many reports it was stated that the prevalence rate of ASB was associated to sex, declare 19-33% in males, and 18-50% in females [4-6]. The prevalence rate of ASB in the elderly in our

data was 10.94%, which is less than some previous reports [3,12]. The different of our prevalence rate with other reports, probably is related to the difference of age, difference of institution (our cases were tend at home), social behaviour of the elderly, and geographic region of cases.

Rodhe *et al.* [15] showed that ASB was found in 18.3% of elderly community residents and it was two-fold greater in female than male. The results of our study did not show the association of increasing age and progress of prevalence rate of ASB (Table 1). It was not completely consistence with other reports [5,13], whereas this finding is similar to Lin *et al.* [16] finding. Our data showed that the prevalence rate of ASB in elderly female is higher than the elderly male, and it confirmed with the previous reports [1,3]. Rodhe *et al.* [1] studied the relation of ASB with sex and their results correspond to our findings.

Escherichia coli was stated as the major bacterial agent isolated from ASB in elderly population in many reports [12,17], but *S. saprophyticus* was not considered as an important microbial agent in elderly population. In our study, *S. saprophyticus*, the upper most of bacterial pathogenic agents, were isolated from ASB in elderly cases, followed by *E. coli* and *K. pneumoniae*, *P. mirabilis*, *S. aureus*, and *P. aeruginosa* in both sexes. The difference between our study and Hedin *et al.* [12] and Ouslander *et al.* [17] probably due to our district that has a tropical climate and the kind of elderly tend.

Our finding about percentage of isolated bacteria, except *S. saprophyticus*, was nearly consistent with previous reports [16-18]. Treatment of ASB with antibacterial agents does not decrease morbidity and mortality of asymptomatic bacteriuria and bacteria will only temporarily be eliminated, but leads to increased antibiotic resistance [3,18]. In the

other hand Nicolle [19] stated that 45% of elderly with urinary tract infection were shown to be infected with multidrug-resistant bacteria. Thus antibiotic therapy is probably not satisfactory for the treatment of ASB especially if antibacterial susceptibility test has not been carried out. The groups of fluoroquinolone antibacterial were used as the first line of antibiotic therapy in the elderly population [20]. Fortunately, our finding revealed that 72.87% of bacteria isolated from elderly ASB are sensitive to ofloxacin in our region.

Conclusion

It is concluded that elderly ASB in our region was less than other's findings and *S. saprophyticus* was the major isolated bacteria, and ASB was not associated with increasing of age.

Conflict of interest statement: All authors declare that they have no conflict of interest.

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References

- 1) Ribeiro RM, Rossi P, Guidi HG, Pinotti JA. Urinary tract infections in women. *Int Urogynecol J Pelvic Floor Dysfunct.* 2002; 13: 198-203.
- 2) Nicolle LE. Asymptomatic bacteriuria in the elderly. *Infect Dis Clin North Am.* 1997; 11: 647-62.
- 3) Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious diseases society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. *Clin Infect Dis.* 2005; 40: 643-54.
- 4) Rodhe N, Löfgren S, Matussek A, et al. Asymptomatic bacteriuria in the elderly: high prevalence and high turnover of strains. *Scand J Infect Dis.* 2008; 40: 804-10.
- 5) Nicolle LE, Mayhew JW, Bryan L. Prospective randomized comparison of therapy and no therapy for asymptomatic bacteriuria in institutionalized elderly women. *Am J Med.* 1987; 83: 27-33.
- 6) Ouslander JG, Schapira M, Fingold S, Schnelle J. Accuracy of rapid urine screening tests among incontinent nursing home residents with asymptomatic bacteriuria. *J Am Geriatr Soc.* 1995; 43: 772-5.
- 7) Raz R. Asymptomatic bacteriuria. Clinical significance and management. *Int J Antimicrob Agents.* 2003; 22: S45-S7.
- 8) Rahav G, Pinco E, Bachrach G, Bercovier H. Molecular epidemiology of asymptomatic bacteriuria in the elderly. *Age and Ageing.* 2003; 32: 670-3.
- 9) Forbes BA, Sahm DF, Weissfeld AS. Bailey & Scott's diagnostic microbiology. 11th ed, USA, Mosby Company, St. Louis. 2007; 378-422, 871-5.
- 10) National Committee for Clinical Laboratory Standards Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria that Grow Aerobically: Approved Standard. 5th ed. NCCLS document M7-A5. National Committee for Clinical Laboratory Standards 2000; 20: 1-32.
- 11) Al-Haddad AM. Urinary tract infection among pregnant women in Al-Mukalla district, Yemen. *East Mediterr Health J.* 2005; 11: 505-10.
- 12) Hedin K, Petersson C, Wideback K, Kahlmeter G, Molstad S. Asymptomatic bacteriuria in a population of elderly in municipal institutional care. *Scand J Prim Health Care.* 2002; 20: 166-8.
- 13) Nicolle LE. Asymptomatic bacteriuria: when to screen and when to treat. *Infect Dis Clin North Am.* 2003; 17: 367-94.
- 14) Nicolle LE, the SHEA Long-Term-Care Committee. Urinary tract infection in long-term care facilities. *Infect Control Hosp Epidemiol.* 2001; 22: 167-75.
- 15) Rodhe N, Mölsted S, Englund L, Svärdsudd K. Asymptomatic bacteriuria in a population of elderly residents living in a community setting: prevalence, characteristics and associated factors. *Fam Pract.* 2006; 23: 303-7.

- 16) Lin YT, Chen LK, Lin MH, Hwang SJ. Asymptomatic bacteriuria among the institutionalized elderly. *J Chin Med Assoc.* 2006; 69: 213-7.
- 17) Ouslander JG, Schapira M, Schnelle JF. Urine specimen collection from incontinent female nursing home residents. *J Am Geriatr Soc.* 1995; 43: 279-81.
- 18) www.cdc.gov/drugresistance/Healthcare/ltc/12steps_ltc.htm
- 19) Nicolle LE. Resistant pathogens in urinary tract infections. *J Am Geriatr Soc.* 2002; 50(7 Suppl): 230-5.
- 20) Shortliffe LM, McCue JD. Urinary tract infection at the age extremes: Pediatrics and geriatrics. *Am J Med.* 2002; 113 (Suppl 1A): 55S-66S.

