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Original Article

Study of asymptomatic bacteriuria among rural, urban and institutionalized community based Indian elderly

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Declaration

The Declaration of the authors for publication of Research Paper in Asian Journal of Modern and Ayurvedic Medical Science (ISSN 2279-0772) 1 Dr Dhiraj Kishore 2 Prof. Indarjeet Singh Gambhir 3 Dr Amita Diwaker 4 Dr Vishal Khurana 5 Dr Ravi Kant 6 Prof Sampa Anupurba. the authors of the research paper entitled Study of asymptomatic bacteriuria among rural, urban and institutionalized community based Indian elderly declare that We take the responsibility of the content and material of our paper as We ourself have written it and also have read the manuscript of our paper carefully. Also, We hereby give our consent to publish our paper in ajmams , This research paper is our original work and no part of it or it's similar version is published or has been sent for publication anywhere else.We authorise the Editorial Board of the Journal to modify and edit the manuscript. We also give our consent to the publisher of ajmams to own the copyright of our research paper.

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ABSTRACT:

Background: Geriatric age group is rapidly increasing, also there health care requirements. Geriatric age is quite heterogeneous, varying from fit to frail and community to community. Characteristic of elderly varies depending on age group, feeding habits, lifestyle, co-morbidities, functional ability, etc. Most of studies are done in hospital, long term care centre or other institutions resulting in confounding variable like feeding habit, lifestyle, environment in which he/she lived, etc. Any clinical problem relevant to the elderly must be discussed in the context of the characteristics of the elderly population described. With this background we carried out this study to simultaneously assess the symptomatic elderly with significant bacteriuria.



Aim: To document the prevalence of asymptomatic bacteriuria among rural, urban and institutionalized elderly persons.

Method: A cross sectional descriptive study was conducted on institutionalized, mid-urban and rural communities from Feb. 2004 to March 2005 in Varanasi district of India. A total of 450 subjects, 150 from respective categories constituted the sample. After history and examination subjects were divided into symptomatic and asymptomatic. Those who were asymptomatic were investigated. Urine culture was obtained from all elderly who enrolled and colony count done. Persons whose initial urine culture was positive with significant colony count were subjected to repeat urine culture within 7 days.

Result: Out of 450 subjects, asymptomatic individuals were 197 (43.8%) and most of them belonged to the urban population 39% (59/197) followed by rural 30.96% (61/197) and institutionalized 30% (59/197). Prevalence of significant pyuria among asymptomatic population in institutionalized, urban and rural communities were 27.1%, 11.6% and 6.5%, respectively. In the asymptomatic subjects there was statistically significant co-relation between place of residence and significant pyuria ($\chi^2 = 11.03$, Df=2, $p < 0.01$) but it was not observed in the symptomatic individuals ($\chi^2 = 5.03$, Df= 2, $p > 0.05$). In institutionalized females >65 years bacteriuria without symptoms were present in 25% (4/16).

Conclusion: There was statistically significant co-relation between place of residence and significant pyuria.

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INTRODUCTION

Geriatric age group is rapidly increasing, also there health care requirements. Geriatric age is quite heterogeneous, varying from fit to frail and community to community. Characteristic of elderly varies depending on age group, feeding habits, lifestyle, co-morbidities, functional ability, etc. Most of studies are done in hospital, long term care centre or other institutions resulting in confounding variable like feeding habit, lifestyle, environment in which he/she lived, etc. Any clinical problem relevant to the elderly must be discussed in the context of the characteristics of the elderly population described. With this background we carried out this study to simultaneously assess the symptomatic elderly with significant bacteriuria.

MATERIAL AND METHOD

Case selection

Subjects were recruited from institutionalized, mid urban and rural communities in Varanasi district of India. Participants were aged 60 years or older and had no history of moderate to

Detection of pyuria

The number of leucocytes/ml was measured in uncentrifuged, unstained urine using haemocytometer. The leucocytes are counted in the squares
Total number of particles per μl of urine =

Number of leukocytes counted

Chamber depth (mm) \times counted surface area (mm^2) \times dilution

Since there was no dilution employed the formula was reduced to

Number of leukocytes counted

Chamber depth (mm) \times counted surface area (mm^2)

Culture and sensitivity testing

severe dementia. Those who were severely ill, aphasic, comatose or unable to communicate were excluded.

Study design

The present study has been done on institutionalized, mid urban and rural communities from February 2004 to March 2010. A total of 450 subjects, 150 from respective categories constituted the sample. A detailed clinical history, review of previous case record, and a clinical examination were performed for each participant. The study was approved by Ethical Review Committee (Banaras Hindu University, Varanasi). All participants agreed to participate in the study and signed an informed consent in accordance with institutional requirements.

Collection of urine sample

Mid stream urine sample collected in sterile container was used for analysis. Every possible care was taken to prevent contamination. Culture vials so collected at the periphery were transported to laboratory for microscopy, culture and sensitivity within half to one hour.

present at the four corners of the counting chamber; total count was calculated as follows:



This was done by "semi quantitative calibrated loop method". The urine was mixed thoroughly before plating on cysteine lactose electrolyte deficient media (CLED). After incubating overnight at 35-37° C in air; colonies were counted on each plate. The number of colony forming units was multiplied by hundred, as 0.01ml loop was used, to determine the micro organism /ml in original specimen of urine.

Criteria for positive culture

- 10^5 CFU /ml in asymptomatic individuals on two consecutive cultures
- Any pure culture of staphylococcus aureus.¹

The urine samples were cultured in our microbiology department to see the growth of the following microorganisms. Subsequently the cultures were subjected to the antimicrobial sensitivity testing b disc diffusion test with the set protocol.

Data analysis

Elderly persons were interviewed, examined and data collected were analyzed with help of Statistical Package for Social Science (SPSS) software version 10 for windows. Quantitative variables are presented as the means \pm standard deviation, and the qualitative variables are presented as proportions. Chi-square test was used for comparison of proportions. The difference was considered significant when P-value was < 0.05 .

RESULTS

Out of all 450 subjects, asymptomatic individuals were 197 (43.8%) and in this group most of the asymptomatic person belonged to the urban population 39% (77/197) followed by rural 30.96% (61/197) and institutionalized 30% (59/197). In

asymptomatic group males were 11.6%, 14.7% and 12.7% in institutional, urban and rural communities respectively. (table-1&2b)

In the asymptomatic institutionalized subjects, prevalence of significant pyuria was 27.1% as opposed to 29.6% in the symptomatic patients while it was 11.6% and 21.9% in asymptomatic and symptomatic urban population, respectively. Amongst the rural elderly the status of significant pyuria was 6.5% and 15.7% in asymptomatic and symptomatic groups respectively ($P < 0.05$). In the asymptomatic subjects there was statistically significant co-relation between place of residence and significant pyuria ($\chi^2 = 11.03$, Df=2, $p < 0.01$) but it was not observed in the symptomatic individuals ($\chi^2 = 5.03$, Df=2, $p > 0.05$). (table2a & 2b)

Culture was positive in 16.9% and 23% population in the asymptomatic and symptomatic groups in institutionalized elderly. In urban population, it was 6.5% and 16.4% and amongst rural population, it was 9% and 15% amongst asymptomatic and symptomatic groups respectively. Although, there was difference between symptomatic and asymptomatic subjects, it was not statistically significant ($p > 0.05$). There was no correlation between symptom and bacteriuria in symptomatic population.

Bacteriuria without symptoms were found in 10.7% (7/76) in females > 65 years residing in community. In institutionalized females > 65 years bacteriuria without symptoms were present in 25% (4/16). The prevalence of bacteriuria without symptoms in community living elderly (Urban + Rural) males was 5.7% (2/32) in more than 65 years of age.

Discussion



The prevalence of asymptomatic bacteriuria has been documented to be as high as 30-50% of women and 20%-30% in men ¹. Prevalence of asymptomatic bacteriuria in women older than 65 years has been found to be 17-33% of those residing in the community, 23-27% of those residing in residential homes and upto 55% in those who are residents of long term care facilities ²³⁴. In males dwelling in community, older than 65 years, the prevalence of asymptomatic bacteriuria has been found in around 10% ³⁴⁵⁶. In our study the prevalence of bacteriuria without symptoms in community residing females older than 65 years was 10.7%. In institutionalized females of more than 65 years the bacteriuria without symptoms was 25%. 5.7% Community living males of more than 65 years had bacteriuria without symptoms. The pattern of bacteriuria without symptoms in our study is almost parallel with the asymptomatic bacteriuria found in the other studies. The prevalence of bacteriuria without symptoms amongst institutionalized elderly females almost matches the asymptomatic bacteriuria in females living in residential homes in other studies ⁵⁷⁸. Since we could not follow up the study subjects with repeated cultures our values may be somewhat lower than the exact figures.

Conclusion

1. Bacteriuria without symptoms was quite prevalent in all groups and both sexes.
2. There was no significant correlation between symptoms with bacteriuria and pyuria.
3. There was poor co-relation between significant pyuria and bacteriuria, rather the absence of pyuria was associated with high negative predictive value (95%) for the absence of bacteriuria.

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Table 1: Distribution of symptomatic and asymptomatic subjects

Community	Symptomatic (N) %	Asymptomatic (N) %	Total (N) %
Inst.	91 (60.6%)	59 (39.41%)	150
Urban	73 (48.6%)	77 (51.4%)	150
Rural	89 (59.3%)	61 (40.6%)	150
Total	253 (56.3%)	197 (43.7%)	450

Table 2: Correlation between symptoms, significant pyuria and bacteriuria

A. Symptomatic population

Study population	Symptoms (N)	Pyuria (N) %	Culture (N) %
Institutionalized	91	27 (29.6%)	21(23%)
Urban	73	16 (21.9%)	11 (15%)
Rural	89	14 (15.7%)	7 (7.8%)
Total	253	57 (22.5%)	39 (15.4%)



(B) Asymptomatic:

Study population	Asymptomatic	Pyuria		Culture	
	Subjects	(N)	%	(N)	%
Institutionalized	59	16	(27.1%)	10	(16.9%)
Urban	77	9	(11.6%)	7	(9%)
Rural	61	4	(6.5%)	4	(6.5%)
Total	197	29	(14.7%)	21	(10.6%)

