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RESEARCH ARTICLE

ASYMPTOMATIC BACTERIURIA IN DIABETIC INDIVIDUALS IN RURAL AREA OF LATUR DISTRICT, MAHARASHTRA

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ABSTRACT

Urinary tract infections (UTI) are known from antiquity. Population studies throughout the world have shown a rise in the prevalence of asymptomatic bacteriuria (ASB) with age, especially the prevalence of asymptomatic bacteriuria is on rise in diabetic individuals. An attempt has been made to find out the prevalence of asymptomatic bacteriuria in diabetic individuals from rural area of Latur district. A total of 424 clinical samples of mid-stream urine (212 from asymptomatic individuals of diabetes mellitus and 212 from control group) were processed to find out the prevalence of asymptomatic bacteriuria using standard procedures. Of the 212 cases from study group, 35 (16.50%) were positive and among the control group, seven (3.30%) were positive. In a study group, 23.94% were from the age-group 46-65 years and in control group, 4.10% were from 46-65 years. The ASB was found significantly higher in study group (P=0.04). In a study group, the prevalence was higher in females (29.63%) than males (8.40%); however, in a control group the prevalence was higher in males (4.28%) than females (2.10%). The results indicate that the prevalence of ASB is significantly higher in diabetic individuals and is more commonly seen in higher age groups and females.

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INTRODUCTION

Asymptomatic infections are equally important as symptomatic infections in regards to health hazards. Majority of the asymptomatic infections go unnoticed due to lack of clinical symptoms and signs, and do not receive treatment as patients remain unaware about the asymptomatic infections. Urinary tract infections (UTI) are divided into symptomatic bacteriuria and asymptomatic bacteriuria (ASB). ASB is defined as "the presence of at least 10^5 colony forming unit (CFU)/ml of one or two bacterial species in a clean-voided midstream urine sample from an individual without any symptoms of UTI (Leigh, 2005; Colgan *et al*., 2006; Nicolle *et al*., 2005). The diabetic individuals are more prone to both symptomatic and asymptomatic UTI because of the compromised defence mechanisms. Diabetes mellitus has been found to be a significant risk factor for developing various complications of UTI such as renal papillary necrosis, emphysematous cystitis, emphysematous pyelonephritis, etc. that ultimately lead to renal failure. In the present study, an attempt has been made to find out prevalence of asymptomatic bacteriuria in diabetic individuals from rural area of Latur district.

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MATERIALS AND METHODS

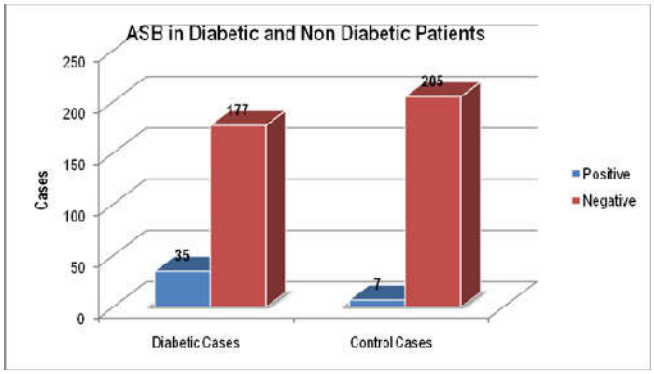
The study was conducted during November 2013 to October 2015 and includes two groups: asymptomatic individuals with diabetes mellitus and age and sex matched controls without diabetes. The demographic details of the patients of a total of 424 individuals (212 diabetic individuals and 212 control) were recorded. A sample of mid-stream urine (212 from asymptomatic individuals of diabetes mellitus and 212 from control group) from the individuals attending outpatient departments in a tertiary care hospital in rural area were collected. The specimens were transported immediately to microbiology laboratory and processed for isolation and identification of pathogen. Specimens of urine showing counts $> 10^5$ CFU/ml were considered as significant bacteriuria.

RESULTS

Distribution of cases of asymptomatic bacteriuria among study group (diabetic) and control group (non-diabetic)

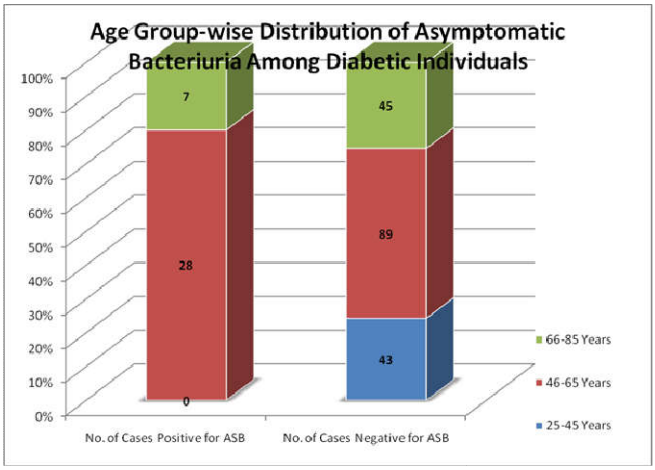
Of the 212 cases from study group, 35 (16.50%) cases were having significant bacteriuria (positive for ASB) and 177 (83.50%) cases were negative for ASB. Among the control group, seven (3.30%) cases were positive for ASB and 205 (96.70%) cases were negative for ASB. The ASB was found to

be significantly higher in study group than the control group (P<0.001).



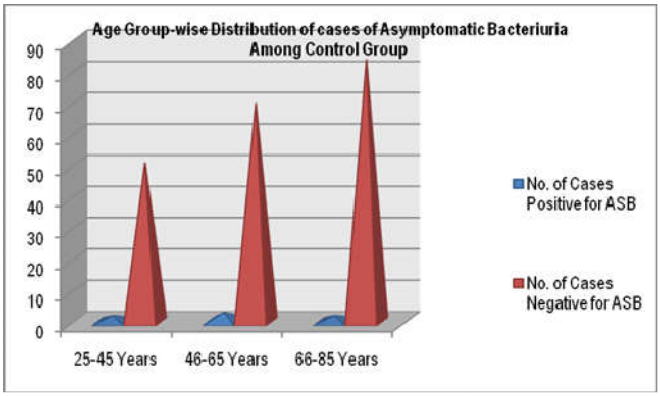
Age group-wise distribution of cases of asymptomatic bacteriuria among the study group

Among the study group, out of 212 diabetic individuals, 35 (16.50%) cases were found positive for ASB and out of 35 cases, 28 (23.94%) were from the age-group 46-65 years and seven (13.47%) were from the age-group 66-85 years. No single case from the age-group 25-45 years was found positive for ASB.



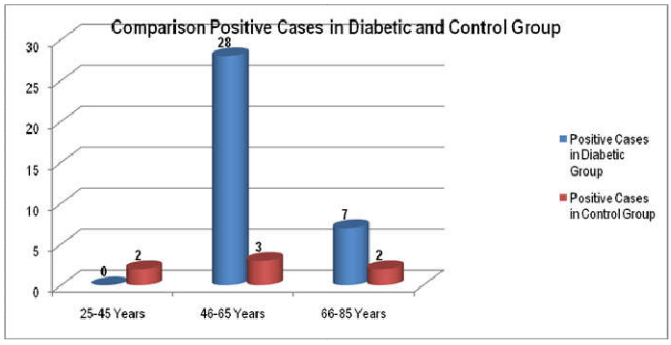
Age group-wise distribution of cases of asymptomatic bacteriuria among control group

Among control group, out of 212 control participants, seven (3.30%) cases were found positive for ASB. Out of seven cases positive for ASB, two (3.77%) were from the age-group 25-45 years, three (4.10%) were from age-group 46-65 years and two (2.32%) were from the age-group 66-85 years.



Comparison of total number of positive cases in study and control groups

In diabetic group, a total of 35 cases were positive for ASB and 177 cases were negative for ASB. The mean age of cases was found to be 63.02 ± 4.84 years. In control group, a total of seven cases were positive for ASB and 205 cases were negative for ASB. The mean age of cases was found to be 59 ± 2.64. The ASB was found higher in diabetic group (P=0.04).



DISCUSSION

The findings of the present study are compared with relevant earlier studies and discussed below. Of the 212 cases from study group, 35 (16.50%) cases showed significant bacteriuria and of the 212 cases from control group, seven (3.30%) cases showed significant bacteriuria. This difference between two groups was found to be statistically significant (P<0.001). In a systematic review and meta-analysis carried out by Renko *et al.,* a prevalence rate was found to be 12.2% (Renko *et al*., 2011). However, in a study by Bonadio *et al.* (2004), a prevalence rate of ASB was found to be 17.5% (Bonadio *et al*., 2004) and 20% in a study carried out by Zamanzad *et al.* (2006). (Zamanzad and Moezzi, 2007) Odetoyin *et al*. (2008) have found prevalence rate of 16%. (Odetoyin *et al*., 2008) However, Patil *et al*. (2012) have reported a prevalence rate of 13%. (Patil *et al*., 2012) Taha *et al.* (2014) reported 15.67%, (Taha and AI-Salihi, 2015) Raveendran and Lakshmipriya (2015) reported 12.6% (Raveendran and Lakshmipriya, 2015) and Rijal *et al.* (2015) reported 18.4% (Raveendran and Lakshmipriya, 2015). The prevalence rate of ASB of 16.50% in diabetic individuals in the present study is not in agreement with the earlier reports, which either report much lower prevalence rates of ASB or much higher rates of prevalence of ASB in diabetic individuals. These results show that there is a great variation in the prevalence rate of ASB in different studies from different geographical areas. Even there is a variation in the prevalence rates of ASB in the studies reported from India and our results are in contrast to many Indian studies also (Pouranik *et al*., 2015). The prevalence rate of 23.94% of ASB in the age-group of 46-65 years in the present study is quite similar to Bissong *et al.* (2013), (Bissong *et al*., 2013) who reported a prevalence rate of 23.2% in the age-group >50 years but is not in agreement with other earlier studies (Patil *et al*., 2012). In the present study, the prevalence of ASB was found five times higher in diabetic individuals (16.50%) than control group (3.30%). This difference was found statistically significant (P<0.001). This finding showing the higher prevalence rate of ASB in diabetic individuals than control group is quite similar to majority of the studies from abroad as well as from India. (Taha and AI-Salihi, 2015) except for one study by Bonadio *et al.* (2004), who reported slightly higher prevalence of ASB in control group (18.5%)

than study group (17.5%) (Bonadio *et al*., 2004). Although a prevalence rate of 23.94% in the age-group 46-65 years was found in the present study, a much lower prevalence (13.47%) was observed among 66-85 years. This is in contrast to the fact that age is a significant risk factor for ASB among diabetic individuals and the prevalence of ASB increases with age. The lower prevalence rate of ASB in the age-group of 66-85 years is difficult to explain but most probably the less number of cases from this age-group might be the reason for lower prevalence rate.

Conclusion

The results of present study indicate that the prevalence of ASB is higher in diabetic individuals, more common in females and in higher age groups. The results further confirm the fact that age is an important consideration for the occurrence of ASB not only in diabetic individuals but also in non-diabetic healthy controls, although it appears to be more significant risk factor in diabetic individuals.

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