

Brief Communication

Prevalence and antimicrobial sensitivity pattern of asymptomatic bacteriuria in type 2 diabetes mellitus patients presenting in tertiary care hospital of Agra, North India

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Abstract

Background: Asymptomatic bacteriuria (ASB) in diabetic patients may have many consequences leading to increased frequency of medical intervention. Therefore, it was aimed to identify the prevalence of ASB and their aetiology and antimicrobial susceptibility in type 2 diabetes mellitus.

Methods: The study group included 152 patients with type 2 diabetes mellitus. The repeat specimen giving colony count $> 10^5$ CFU/mL were taken as significant. The demographic factors were noted on a prescribed proforma.

Results: ASB was present in 23.7%. *E. coli* was most common bacteria isolated in patients with ASB. A high proportion of resistance genes like ESBL and MRSA were found in our isolates.

Conclusion: ASB is common in type 2 diabetes. The study group showed a high percentage of resistance genes, therefore it will be a better approach to treat these patients on the basis of microbiological analysis.

Key words: Antimicrobial drug resistance; bacteriuria; type 2 diabetes mellitus; urinary tract infections.

Introduction

Diabetes mellitus, a disease of metabolic system with increased blood glucose levels, is known to be associated with long term effect on genitourinary system. Hyperglycemia, decreased blood supply or bladder dysfunction in these patients may lead to high prevalence of urinary tract infections [1]. Many times these infections or bacteria are present in diabetic patients without any symptoms or clinical signs which is termed as asymptomatic bacteriuria (ASB). The microbiologic definition of significant bacteriuria is usually greater than or equal to 10^5 colony-forming units (CFU) per millilitre (mL) of the same organism or organisms in two consecutive urine specimens [2]. Many authors have reported higher prevalence of both symptomatic and asymptomatic bacteriuria in diabetic women than non-diabetic women [3]. ASB in diabetics may commonly lead to

symptomatic urinary tract infections (UTI) and also further renal complications. However, despite having a clinical significance in diabetics, the importance and management of asymptomatic UTI is poorly understood. Although in a prospective observational study, ASB has been found to be associated with increased risk of hospitalisation among women with diabetes [4], the treatment of ASB did not reduce the risk of development of symptomatic urinary tract infection in another study [5]. Therefore, we planned to investigate the presence of ASB in type 2 diabetic mellitus patients to know their aetiology, antimicrobial susceptibility pattern and various demographic factors of ASB in diabetics.

Methods

This study was conducted in Department of Microbiology in association with Diabetic clinic of

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Received: 02-11-2012 | **Accepted:** 12-09-2013 | **Published Online:** 19-09-2013

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Conflict of interest: None declared | **Source of funding:** Nil | **DOI:** <http://dx.doi.org/10.7713/ijms.2013.0046>

Department of Medicine, in Sarojini Naidu Medical College, Agra of North India. Since March 2012 to August 2012, a total of 152 patients of type 2 diabetes mellitus were included in this prospective study. We defined ASB as the presence of at least 10^5 CFU/mL of one or two bacterial species in a repeat culture of clean voided midstream urine. All the patients were properly instructed to collect the mid-stream urine after washing the peritoneal area. All the samples were taken in properly labelled sterile universal container and were transported promptly to the laboratory. All the patients were free from any symptoms of urinary tract infections. All patients were interviewed and their medical histories were obtained using a standardised questionnaire. Patients, who were pregnant, had urinary tract abnormality and/or indwelling catheter and had any symptoms of urinary tract infection were excluded from the study. Only those in-patients were taken in the study whose admission in the hospital was less than 48 hours, who were admitted with non-infective aetiologies, and those who were not having indwelling catheter at the time of sampling. These samples were cultured within two hours on Cysteine Lactose Electrolyte Deficient (CLED) media and incubated aerobically

at 37°C for 24 hours. Cultures with colony counts $\geq 10^5$ CFU/mL were considered as significant bacteriuria. The organisms were identified using standard cultural, morphological and biochemical techniques and antimicrobial susceptibility as per standard guidelines. Patients were divided into two groups on the basis of presence or absence of ASB, and variables were compared in the two groups. All analysis was done using SPSS 14.0 software (Chicago, USA).

Results

A total of 152 diabetes patients without symptoms of urinary tract infection were studied; age range was 40-80 years, with 78 (51.3%) males and 74 (48.7%) females. A total of 36 (23.7%) patients were having asymptomatic bacteriuria (ASB). The mean age of these patients was 59.22 ± 9.76 years and mean duration of diabetes was 7.33 ± 6.42 years. Patients with ASB were as sexually active as patients without bacteriuria (44.4% vs. 62.1% respectively, $p = 0.08$). On routine examination, proportion of abnormalities like presence of pus cells (61.1%), RBCs (11.1%) and glucose in urine (66.7%) was higher in patients with asymptomatic bacteriuria as compared to patients

Table 1- Demographic characteristics in patients of type 2 diabetes mellitus with ASB and without ASB

Parameters		Diabetics with ASB (36)	Diabetics without ASB (116)
Mean Age		59.22 ± 9.76	51.72 ± 10.74
Mean duration of Diabetes		7.33 ± 6.42	5.70 ± 4.94
BMI kg/m ²		21.36 ± 3.28	22.06 ± 3.01
Percentage of pus cell in urine		61.11 %	38.88 %
Percentage (%) of RBC in urine		11.11%	5.17 %
Glycosuria Percentage (%)		66.66 %	56.89 %
OPD : IPD		18 : 18	60 : 56
Male: Female		18 : 18	60 : 56
Sexually active		44.44%	62.068%
Diabetic medication in percentage (%)	Oral	55.55 %	56.89 %
	Insulin	5.55 %	1.72 %
	Insulin+OHA	38.88 %	41.37 %

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