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Original Research Article

Comparative Study of Asymptomatic Bacteriuria in Diabetic and Non Diabetic Female Patients Attending a Tertiary Care Hospital

P. Sathishkumar[1], S. Chitralekha[1], G. Bupesh[2]
[1]Department of Microbiology, Sree Balaji Medical College and Hospital, Chromepet, Chennai-600044.
[2]Central Research Laboratory, Sree Balaji Medical College and Hospital, Chromepet, Chennai-600044.

***Corresponding author**
Dr. Sathish Kumar
Email: drsathishkumar1314@gmail.com

Abstract: The aim is to study the prevalence of asymptomatic bacteriuria in diabetic and non diabetic female patients attending a tertiary care hospital. This study was conducted in a tertiary care hospital from July 2015 to December 2015. A total number of 120 diabetic and 120 non diabetic female patients were included in the study. We enrolled female patients with age group of more than 30 years with detailed diabetic history whose urine culture shown bacteriuria of $>10^5$cfu/ml in two consecutive urine specimens. 70% of diabetic and 23.3% non diabetic women are having asymptomatic bacteriuria. In both diabetic and non-diabetic patients asymptomatic bacteriuria more among the elderly females (>50%). E.coli remains the predominant organisms isolated in diabetic (45.2%) and non-diabetic patients (42.8%). The prevalence of asymptomatic bacteriuria is three times higher in diabetic females, with E.coli being predominantly isolated.
Keywords: Asymptomatic bacteriuria, Diabetic patient, elderly females, Escherichia. Coli.

INTRODUCTION:

Urinary tract infections are more common among the healthy females, even female with anatomically normal urinary tract [1, 2]. The frequency of the symptomatic bacteriuria is higher in females with diabetes than females without diabetes [3].

Asymptomatic bacteriuria can defined as finding of atleast 10^5colony forming unit per millimeter of same organism in two consecutive cultures without any symptoms of UTI [4].

Diabetes mellitus, a complex condition (or) syndrome characterised by absolute deficiency (or) resistance to insulin leading to high blood glucose level leads to inadequate glucose transport into muscle[5]. The metabolism of glucose, protein and fat is altered in the diabetic patients [5].

The diabetic patients are having increased risk of fungal, bacterial and viral infections and experience more serious and prolonged infections [6]. The antimicrobial and phagocytic activity of the neutrophils in diabetics shows a decreased bactericidal and chemotactic activity, impaired phagocytosis, low lysosomal enzymes and reactive oxygen radical's release [7]. Due to high apoptotic lymphocytes in diabetics, the circulating lymphocytes are reduced [8].

There is a threefold chance of getting asymptomatic bacteriuria in diabetic female than non-diabetic women [9]. So we undertook this prospective study to estimate the prevalence of asymptomatic bacteriuria among diabetic female patients.

MATERIALS AND METHODS:

This prospective study was conducted by the department of microbiology at a tertiary hospital in Chennai. It was carried out from July 2015to December 2015. Total number of 539 patients was screened, of which 240 patients (120 diabetic and 120 non diabetic) were included in the study. The enrolled female diabetic patients (whose fasting blood glucose is more than125mg/dl and post prandial of more than 200mg/dl) with age group of more than 30 years with detailed diabetic history, whose urine culture shown bacteriuria of more than 10^5 colony forming unit/milliliter in two consecutive urine specimens.

The tests included in the study are renal and liver function test, complete blood picture, urine microscopy and urine culture. Identification and

quantification testing of organisms from the urine cultures was performed by standard conventional methods10.

RESULTS:

63% of diabetic patients having asymptomatic bacteriuria when compared to 30% in non-diabetic patients (Table 1). Almost 53.5% of diabetic and 60.7% of non diabetic females having asymptomatic bacteriuria fall in the age group of more than 55 years.

Among the diabetic patients, having asymptomatic bacteriuria was found to be diabetic of more than 10 years. The prevalence of asymptomatic bacteriuria (54.7%) increases by the duration of diabetes mellitus (Table 2).

E.coli remains the predominant organisms isolated in diabetic (45.2%) and non-diabetic patients (42.8%) followed by klebsiella and enterococcus (Table 3).

Table 1: Characteristics of female patients with diabetes and non-diabetes who had asymptomatic bacteriuria

Characteristics	Diabetes Number (%)	Non-diabetes Number (%)
Total no of females enrolled(in numbers)	120	120
Patient with positive urine culture bacteriuria>10^5CFU/ml	84(70%)	28(23.3%)
Age group of patients with bacteriuria>10^5CFU/ml (in years)		
>55	45(53.5)	17(60.7)
>40	28(33.5)	6(21.4)
>35	9(10.7)	5(17.8)
>30	2(2.3)	0

Table 2: Diabetic history of female patients having diabetes with bacteriuria

Duration of the diabetes in patients having asymptomatic bacteriuria (in years)	Number (%)
<1yr	2(2.3%)
1-5 yrs	9(10.7%)
6-10 yrs	27(32.1%)
11-20 yrs	46(54.7%)
Total	84(70%)

Table 3: Micro- organisms isolated from urine culture

Organism	Patients with diabetes No(%)	Patients without Diabetes No(%)
E.coli	39(45.2)	12(42.8)
Klebsiella	12(14.2)	5(17.8)
Enterococcus	9(10.7)	3(10.7)
Proteus	6(7.1)	3(10.7)
Pseudomonas	4(4.7)	0
Coagulase positive staphylococcus	3(3.5)	2(7.1)
Coagulase negative staphylococcus	3(3.5)	1(3.5)
Candida	8 (9.5)	2(7.1)
Total	84	28

DISCUSSION:

In the present study shows the prevalence of asymptomatic bacteriuria is higher in females with diabetes when compared to non-diabetic females. Geerling SE *et al.;* [11] also found the prevalence of asymptomatic bacteriuria is more in diabetic females (26% in diabetic females, 6% in controls). Arun hari *et al.;* [12] diabetic female patients have, high prevalence of asymptomatic bacteriuria (54%).

In this study there was a three fold increase in the prevalence of asymptomatic bacteriuria in diabetic females than non-diabetic females. Zhanel GG *et al.;* [9] states in diabetic women chance of asymptomatic bacteriuria are three times higher than women without diabetes.

The prevalence of asymptomatic bacteriuria is increase with age in both diabetic and non-diabetic in my study. Boscia JA *et al.;* [13] found the rising prevalence of asymptomatic bacteriuria in females (13.6% to 22.4%).

The glycemic control of the patients were not monitored and not compared with the prevalence of asymptomatic bacteriuria. Schmitt JK *et al.;* [14] found there is no association between asymptomatic bacteriuria and HbA_1C level.

E.coli remains the predominant pathogen in diabetic (62.7%) and in non-diabetic patients (54.1%) followed by klebsiella 14.2%in diabetic and 17.8%in non-diabetic, enterococcus 10.7% in diabetic as well as non-diabetic, proteus 7.1% in diabetic and 0.7% in non-diabetic, pseudomonas 4.7% in diabetic and 0% in non-diabetic. Edward J.Boyko *et al.;* [15] observed asymptomatic bacteriuria caused by E.coli 56.5% in diabetic and 78% in non-diabetic patients, klebsiella species 21.7% in diabetic and 9.8% in non-diabetic followed by group B streptococcus 4.3%in diabetic and 4.9%in non-diabetic, enterococcus species 13% in diabetic and 4.9% in non-diabetic.

CONCLUSION:

The prevalence of Asymptomatic Bacteriuria was 63% in diabetic and 30% in non-diabetic women in this study. The diabetic women, especially the elderly patients and patient having diabetes of more than 10 years found to be an important risk factors in developing Asymptomatic Bacteriuria. Without signs and symptoms of infection starting an antimicrobial therapy for Asymptomatic Bacteriuria is not recommended. For early recognition and treat the risk factors of Asymptomatic Bacteriuria is really important to reduce the occurrence.

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