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ASYMPTOMATIC BACTERIURIA IN WOMEN WITH DIABETES MELLITUS

Medicine

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ABSTRACT

Patients with diabetes exhibit greater frequency of UTI,this is a study to estimate prevalence of asymptomatic bacteriuria among women with diabetes,correlation between bacteriuria and duration of diabetes and correlation between bacteriuria and metabolic control of diabetes.The study was conducted in 200 women with diabetes and 75 non diabetic with diabetesAsram hospital ,the study has shown that the prevalence of asymptomatic bacteriuria is higher in diabetic women than in women without diabetes The study has also shown that age is an important risk factor for diabetic women , women with longer duration of diabetes had a greater risk of asymptomatic bacteriuria and poor metabolic control of diabetes was associated with a significant risk of asymptomatic bacteriuria in women with diabetes

KEYWORDS:

Diabetes mellitus in women , asymptomatic bacteriuria, metabolic control of diabetes ,urinary tract infections

INTRODUCTION

Individuals with diabetes mellitus exhibit a greater frequency and severity of infection. Poorly controlled diabetics are particularly susceptible to infections of urinary tract, respiratory tract, soft tissues and skin.

Urinary tract infections usually present with dysuria, urgency, frequency and suprapubic pain. Many urinary tract infections areasymptomatic especially in women. Most of the symptomatic urinary tract infections are preceded by asymptomatic bacteriuria. Asymptomatic bacteriuria is common in neonates, preschool children, pregnant women, elderly people and diabetics.Asymptomatic bacteriuria occurring in diabetes mellitus can cause serious complications like emphysematous pyelonephritis, renal papillary necrosis and renal abscess.

AIMS

1. To estimate the prevalence of asymptomatic bacteriuria among women with diabetes mellitus.
2. To verify whether there is a correlation between bacteriuria and the known duration of diabetes.
3. To verify whether there is a correlation between bacteriuria and the metabolic control of diabetes.

MATERIALS AND METHODS

SETTING

The study was conducted in the medical wards of ASRAM Hospital, ELURU.

DESIGN OF STUDY

Prospective cross sectional study,

PERIOD OF STUDY

The study was conducted between September 2015 and march 2017 .

SAMPLE SIZE

The study was conducted on 200 diabetic women and 75 age matchednondiabetic women.

SELECTION OF STUDY SUBJECTS AND CONTROL

Two hundred women with diabetes mellitus were enrolled in the study. These women were patients at the Department of general medicine at ASRAM hospital ,ELURU. A randomly selected control group of 75 healthy women without diabetes was also evaluated in the same period.

EXCLUSION CRITERIA

- Patients with symptoms of urinary tract infection.
- Bladder catheterization during the 2 months before enrolment in the study.
- Instrumentation of urogenital tract during the 2 months before enrolment in the study.
- Pregnancy.
- Use of antimicrobial drugs during the previous 14 days.
- Recent hospitalization or surgery within the past 4 months.
- Gynecological infections

DEFINITIONS

Asymptomatic bacteriuria: Asymptomatic bacteriuria is defined as the presence of at least 105 colony forming units per ml of 1 or 2 bacterial species in a culture of clean-voided midstream urine specimen from an individual without symptoms of urinary tract infection.

Contaminated Urine: Contaminated urine is defined as the presence of at least 3 different microorganisms in 1 urine specimen.

Leucocyturia: is defined as the presence of more than 10 leucocytes per high power field in the sediment of centrifuged urine.

DETAILS OF MATERIALS

Urine specimen was collected by clean catch mid streammethod. Patients were explained about the methods of collecting clean catch midstream urine and elderly female patients were provided with a nursing assistant for cleaning the external genitalia. Urine was collected in a sterile wide mouthed screw cap bottle for culture purpose and another sample collected for microscopic examination of leucocyturia.

The number of white blood cells per cubic millimeter of urine was estimated using haemocytometer in microscope. Urine samples were streaked on nutrient agar and MacConkeyagar for confirmation of bacterial growth. Identification of urine isolates was performed using conventional methods and the invitro susceptibility to antimicrobial drugs was tested by the Kirby-Bauer disc diffusion method.

CONSENT

Informed consent was obtained from the patients and the control group.

LIMITATIONS

Glycated haemoglobin was not estimated due to technical difficulties.

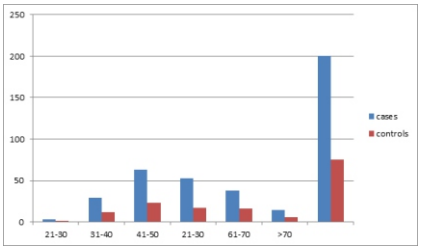
STATISTICALANALYSIS

Statistical analysis was done using standard statistical packages.

RESULTS

Table 1. Age-distribution of cases and controls

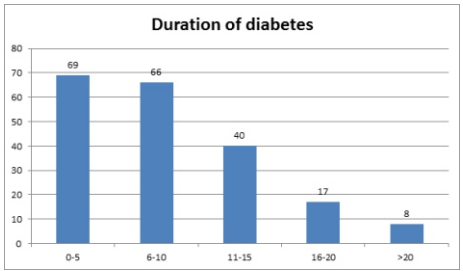
Age group(years)	Cases	Controls
21-30	3	1
31-40	29	12
41-50	63	23
21-30	53	17
61-70	38	16
>70	14	6
Total (n)	200	75



DURATION OF DISEASE

Table 2. Duration of disease among diabetic women

Duration of diabetes in years	Number of cases
0-5	69
6-10	66
11-15	40
16-20	17
>20	8
Total (n)	200



GLYCEMIC CONTROL

Table 3. Fasting plasma glucose values in study group

Fasting plasma glucose(mg/dl)	Number of patients
<80	24
81-120	78
121-160	50
161-200	32
201-240	12
>240	4
Total	200

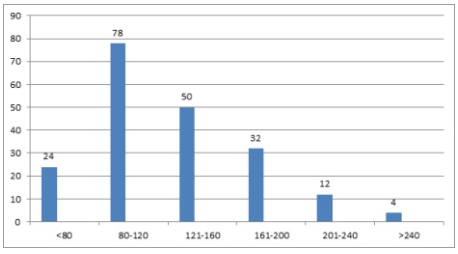


Table 4. Postprandial plasma glucose values in study group

Postprandial plasma glucose	Number of patients
120-160	36
161-200	63
201-240	50
241-280	26
281-320	19
>320	6
Total	200

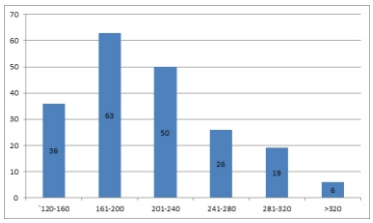


Table 5. Demographic and clinical features of study group

n	200
Age(years) of onset	52.1 ± 11.1
Duration(years) of disease	7.8 ± 6.0
Height(m)	1.5 ± 0.3
Weight(kg)	56.1 ± 7.8
BMI(kg/m2)	24.7 ± 4.6
Fasting plasma glucose (mg / dl)	126.9 ± 44.1
Postprandial plasma glucose (mg / dl)	207.7 ± 54.9

Table 6. Age-distribution of bacteriuric and non-bacteriuric Diabetic Women

Age group(years)	ASB+	ASB-
21-30	00	03
31-40	08	21
41-50	20	43
51-60	16	37
61-70	15	23
>70	09	05
TOTAL (n)	68	132

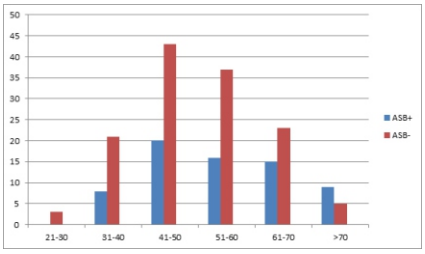


Table7. Duration of diabetes among bacteriuric and nonbacteriuric Women

Duration of disease(yrs)	ASB+	ASB-
0-5	19	50
6-10	20	46
11-15	17	23
16-20	08	09
>20	04	04
TOTAL(n)	68	132

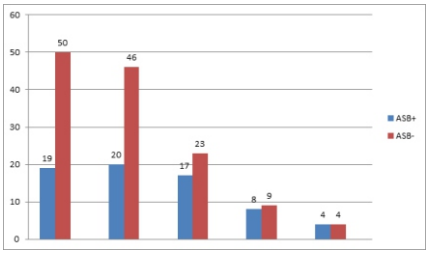


Table 8. Demographic and clinical characteristics of diabetic women with and without bacteriuria

Characteristic	ASB+	ASB-	P value
N	68	132	
Age(yrs)	53.8 ± 12.0	51.2 ± 10.6	<0.05
Duration of diabetes	9.1 ± 6.4	7.1 ± 5.7	<0.05
Fasting plasma glucose(mg/dl)	156.9 ± 45.0	111.5 ± 34.7	<0.05
Post prandial plasma glucose(mg/dl)	242.8 ± 53.1	192.1 ± 46.6	<0.05

DISCUSSION

In this study, it was found that the prevalence of asymptomatic

bacteriuria is higher in women with diabetes than in women withoutdiabetes (34 vs. 8%).

Age is a well-known risk factor for bacteriuria in women without diabetes. In the present study also, age was an important risk factor for asymptomatic bacteriuria in diabetic women. Few of the earlier studies, however, have not shown an increased incidence of asymptomaticbacteriuria in elderly women 'with diabetes.

In the present study, a significant correlation was foundbetween the known duration of diabetes mellitus and asymptomaticbacteriuria in women with diabetes. The duration of diabetes mellitusamong bacteriuric and nonbacteriuric women was 9.1 ± 6.4 years and 7.1 ± 5.7 years respectively ($P < 0.05$). Mean duration of diabetes mellitus was significantly greaterin diabetic women with bacteriuria than in those without infection (9.9 + 1.5 vs. 5.4 ± 0.4 years, $P < 0.02$). The higher incidence of asymptomatic bacteriuria in women with longer duration of diabetes mellitus may be contributed to autonomic dysfunction19 of the bladder which promotes stasis of urine and infection.

In this study, a significant correlation was found between metabolic control of diabetes and asymptomatic bacteriuria in women with diabetes. Both fasting and postprandial plasma glucose values correlated with presence of bacteriuria. This means that significant impairment of metabolic control of the disease increases the risk of developing asymptomatic bacteriuria.

CONCLUSIONS

In conclusion, this study has shown that the prevalence of asymptomatic bacteriuria is higher in diabetic women than in women without diabetes. The prevalence of asymptomatic bacteriuria in diabetic women was 34% and among non-diabetic women was 8%.

The study has also shown that age is an important risk factor for diabetic women. The age among bacteriuric women was 53.8 ± 12.0 years and among non-bacteriuric women was 51.2 ± 10.6 years ($P<0.05$).

In the present study, women with longer duration of diabetes had a greater risk of asymptomatic bacteriuria. The duration of diabetes among bacteriuric and non-bacteriuric women was 9.1 ± 6.4 and 7.1 ± 5.7 years respectively.

Poor metabolic control of diabetes was associated with a significant risk of asymptomatic bacteriuria in women with diabetes. Statistically significant elevation of both fasting and postprandial plasma glucose values was found in bacteriuric diabetic women (Fasting 156.9 + 45.0 and Postprandial 242.8 ± 53.1 mg / dl) when compared with non-bacteriuric diabetic women (Fasting 111.5 ± 34.7) and Postprandial 192. 1 ± 46.6 mg/dl).

Leucocyturia was found in 82% of positive urine culture (56 out of 68) in the study group comprising of diabetic women and in 83% of positive urine culture (5 out of 6) in the control group comprising of non-diabetic women.

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