ORIGINAL RESEARCH

Prevalence of Asymptomatic Bacteriuria in Females Suffering from Type 2 Diabetes Mellitus: An Institutional Based Study

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ABSTRACT
Introduction: Asymptomatic bladder infection that is detected by a positive urine culture is also common among diabetes mellitus patient which progress to symptomatic infection and subsequent complication. Therefore, it becomes essential to screen urinary tract infection in diabetes mellitus patient so that its progress to complication can be prevented. Hence present study has been designated to know the prevalence of asymptomatic bacteriuria among females affected with diabetes mellitus.
Materials and Methodology: After seeking the prior permission from the institutional ethical committee, a hundred and twenty diabetic female subjects (mean age ± standard deviation: 65.75 ± 11.3 years) who were regularly reporting to the outpatient diabetes clinic of our hospital were enrolled in this study. Various physical examination and the prior interview of the subjects were carried based on a study protocol followed by the investigators.
Results: Out of 12 patients,the duration of 6-10 years, 16% had diabetes for a duration of 11-15 years, 8% were diabetic for a duration of 16-20 years, and 3% were diabetic for a duration >20 years. Mean diabetes duration among the cases who had asymptomatic bacteriuria was 9.31 ± 5.95 years and in cases without bacteriuria it was 7.12 ± 5.27 years. There was a statistically significant association between diabetes duration & asymptomatic bacteriuria. **Conclusion:** The urinary tract infection when noticed in such diabetic patients should not be neglected and definite follow-up should be made to supplement the current findings and to appropriately manage the cases of UTI in diabetic patients effectively. As a complication of diabetes, this bacteriuria might possibly be preventable with better glycaemic control and timely & appropriate management of existing ASB.
Keywords: Diabetes Mellitus, Bacteriuria, Urinary Tract Infection, Asymptomatic.

INTRODUCTION
Diabetes mellitus is a chronic condition that usually occurs in two possible ways by either when the pancreas could not able to produce sufficient insulin or the body itselfcould not able to utilise the insulin that has been produced.[1] The worldwide prevalence of diabetes mellitus among the adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014.[2] Patient observed with diabetes mellitus are at a greater risk of infection because of multiple abnormalities in the immune system. Not only that, italso interferes with course of infection making it more complicated than that of normal patients. Various factors are found to be

responsible for this abnormality in the immune system of patients affected with diabetes mellitus. It has been observed in various studies that there is deficiency of C4 compliment in diabetes mellitus. Secretion IL-1 and IL-6 are deprived by mononuclear cells and monocytes in patients with diabetes mellitus. Increased formation of advanced glycosylation end productcould possibly reduce the expression of class I MHC and impairment in the cell immunity.[3,4]

Diabetic patients usually observed with impaired chemotaxis of polymorphonuclear cells, adherence phagocytes and also the killing ability of PMC are also compromised in them invariably.[5] Autonomic neuropathy due to diabetes mellitus could direct to dysfunction of bladder.[6] These entire factors totally comprise explains the pathogenesis of greaterchances of urinary tract infection in diabetes mellitus patient. Asymptomatic bladder infection that is noticed by a positive urine culture is also common among diabetes mellitus patient which progress to symptomatic infection and eventually inadvertent complication. However, it becomes mandatory to detect the urinary tract infection in diabetes mellitus patient so that its progress to complication could possibly be prevented. Hence present study has been designated to know the prevalence of asymptomatic bacteriuria among females affected with diabetes mellitus.

MATERIALS AND METHODOLOGY

After seeking the prior permission from the institutional ethical committee, a hundred and twenty diabetic female subjects (mean age ± standard deviation: 65.75 ± 11.3 years) who wereregularlyreporting to the outpatient diabetes clinic of our hospital were enrolled in this study. Various physical examination and the prior interview of the subjects were carried based on a study protocol followed by the investigators. Subjects with overt diabetic nephropathy (proteinuria) or nephropathy from other causes were possibly excluded. Moreover, subjects with symptoms of UTI (including dysuria, frequency, fever, urgency and abdominal discomfort) or use of antimicrobial drugs in the last 14 days, those observed with vulvo-vaginits, pregnancy, known hypertensive were promptly excluded by the study.

All subjects were personally interviewed during their first visit of study & medical history was obtained. This information includes various vital data including age, diabetes duration, medications, and associated complications of diabetes.

All the data were registered using Microsoft excel 2013 and were further analysed using SPSS V-16. Qualitative data was mentioned in frequencies and percentages and Quantitative data are in mean and standard deviation. Nonparametric statistical analysis using chi-square test/ Fishers exact test was used to detect the significant relation between the two qualitative variables. Unpaired t test and ANOVA was used to find the statistical significance between quantitative variables. The p - value of <0.05 is considered to besignificant statistically.

RESULTS

In this study, the duration of 6-10 years, 16% had diabetes for a duration of 11-15 years, 8% were diabetic for a duration of 16-20 years, and 3% were diabetic for a duration >20 years. Mean diabetes duration among the cases who had asymptomatic bacteriuria was9.31 ± 5.95 years and in cases without bacteriuria it was 7.12 ± 5.27 years. There was a statistically significant association between diabetes duration & asymptomatic bacteriuria. Glycosuria of grade 1+ was seen in 10% of the cases, 10% had 2+, 80% had 3+ and 80% of the cases did not have any glycosuria.In cases of ASB, 15.6% of the cases had 1+, 25% of the cases had 2+ and 59.4% of the cases did not have glucosuria. There was a statistically significant association between glycosuria and ASB.

Table1: Prevalence of Asymptomatic bacteriuria

	Frequency	Percentage
Yes	38	32%
No	82	68%
Total	120	100%

Table 2: Age incidence of Asymptomatic Bacteriuria

Parameters	Asymptomatic bacteriuria				Total	
	Present		**Absent**			
	N	%	N	%	N	%
30 – 40	5	12	16	21	22	18
41 – 50	13	30.8	25	32	38	32
51 – 60	10	24.5	16	19.4	25	21
61 – 70	11	25.5	17	21.8	28	23
71 – 80	3	7.2	3	4.4	6	5
81 – 90	0	0	1	1.4	1	1
Total	42	100	78	100	120	100

[$\chi=1.89$; $p=0.89$]

Table 3: Diabetic remission and bacteriuria in the urine

Parameters (years)	Asymptomatic bacteriuria				Total	
	Present		**Absent**			
	N	%	N	%	N	%
1 – 5	12	28.5	33	42.6	48	39
6 – 10	16	37.1	26	33.4	41	34
11 – 15	5	12.5	15	18	20	17
16 – 20	8	18.5	2	2.8	8	7
>20	1	3.4	2	3	3	3
Total	42	100	78	100	120	100
Mean ± SD	9.32 ± 5.95		7.2 ± 5.29		7.78 ± 5.59	

[$\chi=16.02$; $p=0.001*$]

Table4: Association between Glucosuria and Asymptomatic bacteriuria

Parameters (years)	Asymptomatic bacteriuria				Total	
	Present		**Absent**			
	N	%	N	%	N	%
1+	6	14.6	7	8.4	14	12
2+	11	26	1	1.5	10	8
No	25	59.4	70	90.1	96	80
Total	42	100	78	100	120	100

DISCUSSION

In this study, it has been observed that 18% of the participants were aged 30-40, 32% were aged 41-50, 21% were aged 51-60, 23% were aged 61-70, 5% were aged 71-80, 1% was aged 81-90 years. Relation between age & asymptomatic bacteriuria was not significant statistically. In the study conducted by *Sibi G* et al,[6] they have noticed that female is more vulnerable to get UTI when compared to men. Many of the studies supported that middle-aged men are more vulnerable to get UTI. In our study we have mainly concentrated on the occurrence of infections in women.

The mean age of the participants in the study conducted by *Gutema T* et al[7] were 44 years (±15.6 standard deviation). A large proportion (24.9%) of the participants falls in the age group 35 - 44 years & the male - female ratio was 1:0.85.In this study, UTI was possibly considered to be higher among diabetic females than males. This was in accordance with previous studies conducted in the countries like Debre Tabor, Northwest Ethiopia, United States of America, and Timisoara, Romania. The greater chances for the risk of infection in females could be due to that urethra in females is much shorter and very close to the anus, which is a constant source of faecal bacteria irrespective of such condition like diabetes mellitus. In this study, in 38% of the subject duration of diabetes was for 1-5 years, 35% of the subjects were diabetic for. Duration of 6-10 years, 16% had diabetes for a duration of 11-15 years, 8% were diabetic for a duration of 16-20 years, and 3% were diabetic for a duration >20 years.Mean diabetes duration among the cases who had asymptomatic bacteriuria was9.31 ± 5.95 years and in cases without bacteriuria it was 7.12 ± 5.27 years. There was a statistically significant relation between diabetes duration & asymptomatic bacteriuria. Occurrence of asymptomatic bacteriuria was reported to be significantly higher in cases with longer duration of diabetes. The study conducted by*Nabi T* et al[8]*Gutema T* et al[7] and *Yismaw G*[9]were also observed with consonant result in accordance with the present study stating that the duration of diabetes had a highly significant statistical association with asymptomatic bacteriuria.

In the present study, it has been nailed out that glycosuria of grade 1+ was seen in 10% of the cases, 10% had 2+, 80% had 3+ and 80% of the cases did not report to have any glycosuria.In cases of ASB, 15.6% of the cases had 1+, 25% of the cases had 2+ and 59.4% of the cases did not have glucosuria.There was a statistically significant association between glycosuria and ASB.

CONCLUSION

The urinary tract infection when noticed in such diabetic patients should not be neglected and definite follow-up should be made to supplement the current findings and to appropriately manage the cases of UTI in diabetic patients effectively. As a complication of diabetes, this bacteriuriamight possibly be preventable with better glycaemic control and timely & appropriate management of existing ASB.

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