

Research Article

Prevalence of asymptomatic bacteriuria and its antibiotic sensitivity in type-2 diabetic women along the sea coast

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ABSTRACT

Type-2 diabetes women are more prone for Urinary tract infections (UTI). Many UTIs are asymptomatic and whether the symptomatic UTI are preceded by asymptomatic bacteriuria (ASB) is not clear. Hence, the present study is conducted to understand the relationship between ASB and symptomatic UTI among Type-2 diabetic women along the sea coast. A hospital based study conducted in the Narayana Medical College & Hospital, which is situated within 10-15 km radius of the seacoast in Nellore district of Andhra Pradesh, India. 238 subjects were selected, out of these 164 diabetic subjects in the experimental and 56 in the control group. Findings indicate that the prevalence of ASB in type-2 diabetic women is high along the sea coast and significantly associated with nephropathy. The major risk factors include age, duration of diabetes, proteinuria, leucocyturia, glucosuria, nephropathy and rise in plasma glucose. Among the clinical isolates of ASB, gram negative isolates were more than gram positive. These isolates are highly resistant to antibiotics like Ciprofloxacin, Ofloxacin, Gentamicin and Cefotaxime while, sensitive to Amikacin and Cephaperazone ± sulbactam. Thus present study concludes that overall risk factors for ASB in type-2 diabetic women observed are proteinuria, leucocyturia, glucosuria, nephropathy and plasma glucose.

Keywords: ASB, UTI, Antibiotics, Type-2 Diabetes

INTRODUCTION

Diabetes mellitus is a chronic metabolic endocrine disorder which affects the human body by means of physical, psychological and social health.¹⁻⁴ Impaired insulin secretion from pancreatic-beta cells and insulin resistance leads to hyperglycemia which results in altered metabolism of lipids, carbohydrates and proteins.^{5,6} It affects more than 194 million people around the globe with high rates of mortality and morbidity. Its prevalence is more in India, China and USA and is expected to reach to 333 million by 2025.⁷ Diabetes is of 2 types, in which first one referred as genetically based disorder and the other is dietary related disorder which is more common and accounts for 85-95%

of the cases worldwide. Diabetes leads to various acute and chronic complications. Diabetic ketoacidosis, hyperosmolar nonketotic hyperglycemia, lactic acidosis are important acute metabolic complications. Chronic complications include micro vascular (neuropathy, nephropathy and retinopathy) and macro vascular (cerebrovascular accident, cardiovascular disease and peripheral vascular disease).⁸

Infection is the one of the major causes of hospitalization among diabetic patients. Numerous studies revealed that urinary tract, respiratory tract, and soft tissues are the major sites prone for infections commonly found in diabetic patients.⁹⁻¹² Altered host defense mechanism,

vascular abnormalities, and frequent hospital admissions are responsible for its increased incidence.¹³⁻¹⁶ The host defense system in diabetic patients is impaired due to migration of neutrophils, phagocytosis, and chemotaxis of polymorphonuclear leukocytes, followed by other complications related to neuropathy, which leads to malfunction of urinary bladder.^{10,14,17} Urinary tract is the easily accessible site for infections. Presence of high amounts of glucose in urine serves as a culture medium for pathogenic microorganisms. Urinary tract infections (UTI) in diabetic patients lead to serious complications such as emphysematous cystitis, pyelonephritis, renal or perinephric abscess, bacteremia and renal papillary necrosis.^{13,18,19} In India the prevalence of UTI is under reported in type-2 diabetic women. Very few studies reveal its incidence and it was estimated that about 36.3% in hospitalized patients and 16.5% in non hospitalized patients respectively.²⁰

UTIs are generally asymptomatic but fewer times they are symptomatic. Till today the conversion of asymptomatic to symptomatic bacteriuria is not clear. These UTIs are more common in women rather than men. Moreover diabetic women are more prone for asymptomatic bacteriuria (ASB) than nondiabetic women.^{9,13} The major risk factors associated with ASB in diabetic women varies with age, duration of diabetes and complications like proteinuria, leucocyturia, glucosuria, and nephropathy etc.^{6,21,22} Several studies clearly demonstrated that most of the diabetic patients with UTI complications often leads to subclinical pyelonephritis. Moreover diabetic women who reside along the sea coast are more prone to infections.²³ The prevalence of UTI and its association with ASB in diabetic women along the sea coast has not yet been studied in detail. The relationship between ASB and symptomatic UTI is of paramount importance in diabetic women. Therefore the present study is conducted in aim to understand the relationship between ASB and symptomatic UTI among type-2 diabetic woman along the sea coast.

METHODS

Study Design: A hospital based case control study has been carried out in the outpatient section of the department of general medicine, Narayana Medical College & Hospital (NMCH), Nellore, Andhra Pradesh, India, situated within 10km of seacoast.

Period of Study: The work was carried out from Jan-2011 to Jun-2012, over a period of 1 year 6 months.

Inclusion Criteria: Adult women with type 2 diabetes mellitus residing along the sea coast with informed consent were included.

Exclusion Criteria: Those who are not willing/interested, had one or combinations of the following were excluded. Symptoms of UTI (dysuria, frequency, urgency, abdominal discomfort, fever etc.), Vulvovaginitis,

Pregnancy, Recent hospitalisation or surgery (<4 months), Known urinary tract abnormalities (including cystopathy, etc.), Recent urinary tract instrumentation (catheterization, etc.), Culture positive for three or more organisms, funguria, Use of antibiotics in the last 14 days, Past history of UTI, Hypertension.

Sample Size: Study subjects: 238 type 2 diabetic women, Control subjects: 64 non-diabetic women.

Details of the study

In the present study 238 women suffering with type-2 diabetes were enrolled in the experimental group and 64 subjects without diabetes in the control group. Out of this, 74 subjects from the experimental group and 8 subjects from the control group were excluded based on the exclusion criteria. All were interviewed during their first visit and medical history has been documented with lab investigations such as blood urea, plasma glucose and serum creatinine. Among the experimental / control group, diabetic status was confirmed by assessing 2 hour oral glucose tolerance test, 1-2 as described.^{24,25} Mid stream urine was collected in a sterile container and subjected to appropriate clinical laboratory investigations. The specimen was inoculated for antibiotic sensitivity as per CLSI guidelines.

The clinical isolates were subjected for antibiotic sensitivity by using commercially available antibiotics (Himedia) like fluoroquinolones (Ciprofloxacin, Ofloxacin), aminoglycosides (Gentamicin and amikacin) cephalosporins (Cefotaxime and Cefoperazone ± Sulbactam) Nitrofurantoin, Meropenem, vancomycin and penicillin-G. These isolates were tested by Kirby Baur's disc diffusion method as per CLSI guidelines.²⁶ Retinopathy was diagnosed based on fundoscopy, nephropathy based on microalbuminuria, CNS/neuropathy based on history and nerve conduction studies, cardiovascular complications based on 2D-echo and peripheral vascular disease based on history.

Statistical Analysis

The statistical analysis has been performed using SPSS-16 version software. Differences between subjects with and without ASB were obtained through 't-test' for continuous variables (age, duration of diabetes, urea and creatinine). For nominal variables 'Chi-Square test' was used. In addition, leucocyturia was used as a dependent variable and age, duration of diabetes, nephropathy, neuropathy, and ischemic heart disease as independent variables. Multiple Logistic Regression analysis was performed. P value of <0.05 was considered as significant. Mean values are reported as Mean ± SD.

RESULTS

The present investigation is carried to assess the role of ASB and symptomatic UTI among type-2 diabetic

women who reside near the sea coast. A hospital based case control study has been carried out in the outpatient section of department of general medicine (NMCH) and 238 subjects were enrolled in the study. Out of these 164 subjects in the experimental group and 56 in the control group were included according to exclusion and inclusion criteria as mentioned above. Different variables have been studied and study findings displayed in table-1. Initially the variable 'age' has been studied to demonstrate the distribution pattern of type-2 diabetes among various age groups. The results indicate most of the women in the experimental group found to be in the range of 31 to 80 years with a mean of 52.4 ± 11.2 and median of 52 years. Next, we studied the variable 'duration of diabetes' to reveal its time pattern. The 'duration of diabetes' in the observed age groups found to be between 1 to 20 years with a mean of 6.3 ± 4.5 and median of 5 years. Later, we analyzed the biochemical parameters to measure the effect of diabetes. The data suggest that the mean values of plasma glucose (308.3 ± 77.5) was higher and remaining parameters such as, blood urea (32.8 ± 12.4 mg/dl) and serum creatinine (1.19 ± 0.40 mg/dl) found to be normal. Similarly, control group also exhibited the same trend demonstrating the age pattern in the range of 31 to 80 years with a mean of 51.1 ± 11.8 and median of 50 years. The mean values of plasma glucose (88.7 ± 14.9), blood urea (25.7 ± 6.6 mg/dl) and serum creatinine (1.07 ± 0.21 mg/dl) were found to be normal in the control group.

Further, we assessed the diabetic women to reveal the incidence of micro and macro vascular complications. Experimental group exhibited clinical manifestations related to neuropathy, retinopathy and cardiovascular complications with an incidence of 24.3, 19.5 and 9.1% respectively. Furthermore urine samples were analyzed to demonstrate the proteinuria, glucosuria, leucocyturia and bacteriuria. The findings indicate the incidence of proteinuria, glucosuria, leucocyturia and bacteriuria in diabetic women with a percentage of 18.3, 24.4, 20.1 and 22.6 % respectively.

Finally, urine samples were subjected to culture to identify the microorganisms. The culture report indicates that 37 subjects are positive for microorganisms in the experimental group. The major clinical isolates in the experimental group are predominantly gram negative bacteria which includes *Escherichia coli* (17), *Klebsiella pneumoniae* (10), and gram positive bacteria are *Coagulase negative staphylococci* (4), *Staphylococcus aureus* (5) and *Enterococci faecalis* (1), whereas in control group *Escherichia coli* (2) was isolated from two subjects, and *Klebsiella pneumoniae* from one subject (1). These clinical isolates were further subjected to antibiotic sensitivity by using various antibiotics which include fluoroquinolones (Ciprofloxacin, Ofloxacin,) aminoglycosides (Gentamicin and amikacin) cephalosporins (Cefotaxime and Cefoperazone \pm Sulbactam), Nitrofurantoin, Meropenem, Vancomycin and penicillin-G. The results clearly indicate that the isolated gram negative bacteria in particular with

the *E. coli* strains from the experimental group are more sensitive to Amikacin (17), Gentamicin (13), Nitrofurantoin (13) and Cefoperazone \pm Sulbactam (17) and resistant to Ciprofloxacin (10), Ofloxacin (10) and Cefotaxime (7). *Klebsiella pneumoniae* were sensitive to Meropenem (10), Amikacin (10), Cefoperazone \pm Sulbactam (10) and resistant to Ciprofloxacin (3), Ofloxacin (3), Gentamicin (3) and Cefotaxime (4).

The gram positive bacteria like *Coagulase negative staphylococci* were sensitive to Ofloxacin, Amikacin, vancomycin and Cefoperazone \pm Sulbactam and exhibited resistance to Ciprofloxacin (3), Penicillin-G (2) and Cefotaxime (2). *Staphylococcus aureus* were highly sensitive to antibiotics like Amikacin, vancomycin and Cefoperazone \pm Sulbactam and resistant to Ciprofloxacin (4), Ofloxacin (3) and Cefotaxime (3). *Enterococci faecalis* also exhibited sensitivity towards Ciprofloxacin, vancomycin, Ofloxacin, Amikacin and Cefoperazone \pm Sulbactam and resistance towards Penicillin-G (1) and Cefotaxime (1).

The above findings suggest that most of the observed clinical isolates are sensitive to antibiotics like Amikacin, Nitrofurantoin, Meropenem, Vancomycin and Cefoperazone \pm Sulbactam and resistant to fluoroquinolones. The percentage of ASB distribution varies from the experimental group to that of control and in the range of 22.6 and 5.36% respectively.

Further, statistical Analysis also performed to demonstrate the prevalence of ASB and its significance in comparison with other variables. Statistical analysis revealed a highly significant relationship between bacteriuria and leucocyturia ($p < 0.001$). Bacteriuria observed in 23.3% of diabetic women with 'duration of diabetes' less than 5 years, in 20.0% women with 5 to 10 years and in 24.2% women with more than 10 years of duration respectively. Out of 164 subject's 37 who had positive urine culture, 70% had proteinuria. In addition 64.8% of diabetic women with bacteriuria also displayed leucocyturia. However, experimental and control group without bacteriuria showed no evidence of leucocyturia. Among the subjects with bacteriuria, 51.3% had glucosuria, whereas subjects without bacteriuria, 91.3% had no glucosuria. Among the ASB positive subjects, the major complications are retinopathy, nephropathy, neuropathy, cardiovascular and cerebrovascular disease were observed in 24.3, 21.6, 16.2, 10.8 and 2.7% respectively. None of them had peripheral vascular disease. In experimental group age, duration of diabetes, proteinuria, glucosuria, leucocyturia, nephropathy, plasma glucose and serum creatinine, had significant association with ASB, however the other variables like retinopathy, neuropathy and macrovascular complications has no association. Sensitivity, specificity, positive predictive value and negative predictive value of leucocyturia with reference to asymptomatic bacteriuria found to be in the range of 64.8, 92.9, 72.7 and 90.0% respectively. Thus the finding clearly indicates that the

presence of ASB is more in diabetic women suffering with nephropathy when compared to others which has statistical significance.

Table 1: Characteristics of experimental and control group in relation to different variables.

Variables	Total no of cases (164)	%	Asymptomatic bacteriuria			
			Positive	%	negative	%
Age (years)						
30-40	30	18.3	6	16.2	24	83.8
41-50	46	28.0	11	29.7	35	70.3
51-60	53	32.3	16	43.2	37	56.8
>60	35	21.3	4	10.8	31	89.2
31-80 years (median 52years) (mean52.4+-11.2)	164					
Control group-age wise distribution						
30-40	12	21.4	0	0.00	12	100
41-50	17	30.4	0	0.00	17	100
51-60	16	28.6	1	6.25	15	93.7
>60	11	19.6	2	18.1	9	81.9
31-80 years (median 50years)(mean 51.8+-11.8)	56					
Study group-duration of diabetes						
<5	74	45.1	17	45.9	57	54.1
5-10	57	34.7	12	32.4	45	67.6
>10	33	20.1	8	21.6	25	78.4
Micro and macro vascular complications						
Retinopathy	32	19.5	9	24.3	23	75.7
Nephropathy	11	6.7	8	21.6	3	78.4
Neuropathy	40	24.3	6	16.2	34	83.8
Cardiovascular system	15	9.1	4	10.8	11	89.2
Central nervous system	3	1.8	1	2.7	2	97.3
Peripheral vascular disease	5	3.0	0	0.00	5	100
Urine analysis						
Proteinuria	30	18.3	19	51.3	11	48.7
Glucosuria	41	24.4	26	70.0	15	30.0
Leucocyturia	33	20.1	24	64.8	9	35.2
Prevalence of asymptomatic bacteriuria						
Study group	164	---	37	22.6	127	77.4
Control group	56	---	3	5.36	53	94.6
Validation of Leucocyturia						
Leucocyturia present	---	---	24	64.8	9	7.08
Leucocyturia absent	---	---	13	35.2	118	92.9
Total isolates			37		127	
Microorganisms isolated in experimental group						
<i>Escherichia coli</i>			17	45.9	---	---
<i>Klebsiella pneumonia</i>			10	27.0	---	---
<i>Coagulase negative staphylococci</i>			4	10.8	---	---
<i>Staphylococcus aureus</i>			5	13.5	---	---
<i>Enterococci faecalis</i>			1	2.7	---	---
Microorganisms isolated in Control group						
<i>Escherichia coli</i>			2	66.6	---	---
<i>Klebsiella pneumonia</i>			1	33.3	---	---

Table 2: Microorganisms and its sensitivity pattern towards antibiotics.

Organisms	Ciprofloxacin	Ofloxacin	Amikacin	Gentamicin	Nitrofurantoin	Cefotaxime	Cefoperazone Sulbactam
Gram negative strains							
<i>Escherichia coli</i> (n=17)							
Sensitive	7	7	17	13	13	10	17
Resistant	10	10	0	4	4	7	0
Organisms	Ciprofloxacin	Ofloxacin	Amikacin	Gentamicin	Meropenem	Cefotaxime	Cefoperazone Sulbactam
<i>Klebsiella pneumonia</i> (n=10)							
Sensitive	7	7	10	7	10	6	10
Resistant	3	3	0	3	0	4	0
Organisms	Ciprofloxacin	Ofloxacin	Amikacin	vancomycin	Penicillin-G	Cefotaxime	Cefoperazone Sulbactam
Gram positive strains							
<i>Coagulase negative staphylococci</i> (n=4)							
Sensitive	1	4	4	4	2	2	4
Resistant	3	0	0	0	2	2	0
<i>Staphylococcus aureus</i> (n=5)							
Sensitive	1	2	5	4	0	2	4
Resistant	4	3	0	1	5	3	1
<i>Enterococci faecalis</i> (n=1)							
Sensitive	1	1	1	1	0	0	1
Resistant	0	0	0	0	1	1	0

DISCUSSION

Higher risk of UTI associated with diabetes is demonstrated by few studies.^{13,22} However association between ASB and symptomatic UTI among type-2 diabetic women along the sea coast is still ill defined.^{22,27} Many studies revealed that diabetes leads to various abnormalities related to host defense system, which results in a higher risk of various infections due to

immunological impairments and complications associated with neuropathy.^{10,14,17} In spite of several evidences of above said factors, to the best of our knowledge; there has been no direct demonstration of association between ASB and symptomatic UTI among type-2 diabetic woman particularly along the sea coast of southern India. In one study it has shown that the prevalence of diabetes is more in the coastal area of thiruvananthapuram district of kerala state in southern India but its association with

ASB has not been studied.²³ Hence, studying the association between ASB and symptomatic UTI among type-2 diabetic woman is essential in order to prevent, control and effective management of complications. Therefore, the present study is conducted to assess and reveal the role between the ASB and symptomatic UTI among type-2 diabetic woman along the sea coast of Nellore district of Andhra Pradesh state in southern India.

In the present study, 238 subjects were enrolled. Out of these 164 subjects were in the experimental group and 56 in the control group. Initially various variables were assessed and findings demonstrated in the table-1. Previous studies have reported that the age and duration of diabetes are the major risk factors for ASB.⁹ Therefore, we studied these variables. The findings from our study clearly demonstrated a clear cut demarcation between the distribution pattern of type-2 diabetes among various age groups and duration of diabetes. The data indicate that women in the experimental group exhibited the 'age pattern ranging from 31 to 80 years (mean of 52.4 ± 11.2 , median of 52 years) and duration of diabetes ranging from 1 to 20 years (mean of 6.3 ± 4.5 and median of 5 years) respectively, whereas control group also exhibited the same trend in the age pattern. Mean values of plasma glucose, blood urea and serum creatinine were 308.3 ± 77.5 , 32.8 ± 12.4 mg/dl and 1.19 ± 0.40 mg/dl respectively. In control group mean values of plasma glucose, blood urea and serum creatinine were 88.7 ± 14.9 , 25.7 ± 6.6 mg/dl and 1.07 ± 0.21 mg/dl respectively.

The above data shows that the age is a well known risk factor for bacteriuria in women with type2 diabetes²⁸ which is in accordance with earlier studies¹³ Few studies revealed that duration of diabetes tends to increase the risk for ASB^{5,21} while others could not confirm this notion.^{22,29,30} However, in present study, duration of the disease is also an independent risk factor for ASB.

Many studies reveal that the type-2 diabetes leads to micro and macro vascular complications.⁸ Hence, we assessed the incidence of micro and macro vascular complications among type-2diabetic women. Findings suggest that the subjects in the experimental group exhibited clinical manifestations related to neuropathy, retinopathy and cardiovascular complications. Similar clinical manifestations have been reported in other studies.³¹⁻³³

Several studies described the incidence of proteinuria, glucosuria, leucocyturia and bacteriuria which are the major risk factors among the diabetic woman for ASB and UTI.^{5,21,22} Proteinuria is an expression of severe structural damage to the kidney, causing vulnerable to bacterial attacks which results in high risk for ASB.^{9,13} Glucosuria is known as excretion of glucose into the urine, which serves as a culture media for micro organisms.³⁴ Leukocyturia is known as presence of white blood cells in urine, and also indicator for chronic or acute pyelonephritis and cystitis. Bacteriuria is the presence of bacteria in the urine and its presence up to

$>10^5$ CFU/mL is the major risk factor for ASB and UTI. Therefore, urine samples were analyzed to demonstrate the incidence of proteinuria, glucosuria, bacteriuria and leucocyturia. The findings indicate the incidence of proteinuria, glucosuria, leucocyturia and bacteriuria in diabetic women with a percentage of 18.3, 24.4, 20.1 and 22.6% respectively. Our results are in accordance with other studies demonstrating the incidence of proteinuria, glucosuria, bacteriuria and leucocyturia.^{9,13} In the present study ASB had significant association with the plasma glucose levels,³⁵ in contrast to other studies which demonstrated¹³ that the glycemic control had no association with the ASB. This association may be due to, shift in the plasma glucose levels, which is related to dietary intake, physical activity and drugs (oral hypoglycemic agents or insulin).^{5,6,36} Hyperglycemia leads to increase in the renal threshold which causes glucosuria. Renal threshold to glucose is variable in different individuals and also in the same individual at different times. Hence glucosuria cannot be considered as sole criteria.³⁷

Early detection of leucocyturia is indication for the presence of bacterial infection. The findings of the urine analysis clearly indicate the incidence of leucocyturia which reveals the severity of the ASB and UTI.³⁸ The present study also demonstrates the significant association between ASB and diabetic nephropathy. This may be attributed to glomerular damage of kidney causing protein loss and paves the way for the bacterial attack. Previous studies^{5,20} have been reported that the micro and macro complications serve as high risk factors for ASB in type2 diabetes. However in the present study none of these complications other than nephropathy had significant association with ASB.

Further the urine culture profile of the subjects also showed positivity for micro organisms. These findings clearly indicate that 37 out of 164 type 2 diabetic women had ASB and its prevalence was 22.6%. This is comparable with other similar study which has shown the prevalence of ASB up to 29% in diabetic women.¹³

Among the various clinical isolates from the experimental group, gram negative bacteria found to be dominant represented by strains of *Escherichia coli* (17), *Klebsiella pneumoniae* (10), while gram positive bacteria is limited with few strains like *Coagulase negative staphylococci* (4), *Staphylococcus aureus* (5) and *Enterococci faecalis* (1). Similarly from the control group, the bacteria were isolated from the subjects and represents with the strains of *Escherichia coli* (2), and *Klebsiella pneumoniae* (1). The above results are in accordance with findings of few recent studies.³⁹ The pathogen *Escherichia coli* (45.9%) is the most prevalent bacteria, followed by *Klebsiella pneumoniae* (27%) observed in the present study. Earlier studies also showed *Escherichia coli* as a the most common pathogen in the diabetic people along with the *Klebsiella pneumoniae* either with ASB or with clinical manifestations of UTI.^{40,41,42} Many studies have

demonstrated the resistance of bacteria to various antibiotics results in conversion of ASB into symptomatic bacteriuria in UTI which leads to major complications⁴³ among diabetic women. Hence, in the present study antibiotic resistance pattern among the cultures has been investigated by using various antibiotics like fluoroquinolones (Ciprofloxacin, Ofloxacin) aminoglycosides (Gentamicin and amikacin) cephalosporins (Cefotaxime and Cefoperazone+sulbactam), Nitrofurantoin, Meropenem, Vancomycin and penicillin-G. The data revealed that the most of the isolated organisms are highly sensitive towards Amikacin, Nitrofurantoin, Meropenem, Vancomycin and Cefoperazone+sulbactam where as decrease in sensitivity pattern has been noticed with other antibiotics like Ciprofloxacin, Ofloxacin, Gentamicin and Cefotaxime.⁴⁴ The finding of other studies also correlated with the present study revealing the similar pattern of antibiotic sensitivity.⁴¹ Thus, findings from the current study suggests that the type-2 diabetic women with asymptomatic bacteriuria may have an increased risk of symptomatic urinary infection followed by other complications, which is also supported by our antibiotic sensitivity assay.

The Statistical analysis also clearly defined that there is a highly significant relationship between the bacteriuria and leucocyturia ($p < 0.001$), followed by significant association between bacteriuria and proteinuria ($p < 0.001$), bacteriuria and glucosuria (< 0.001) and as well as bacteriuria with nephropathy ($p < 0.001$). Overall risk factors for ASB in type 2 diabetic women observed in the present study are age, duration, proteinuria, leucocyturia, glucosuria, nephropathy and plasma glucose.

CONCLUSION

Thus, the present study concludes that the prevalence of asymptomatic bacteriuria in type-2 diabetic women is high along the sea coast. The major risk factors observed in this study are age, duration of diabetes, proteinuria, leucocyturia, glucosuria, nephropathy and rise in plasma glucose. The prevalence of ASB was high and significantly associated with type-2 diabetic women with nephropathy. Early detection of leucocyturia is indication of the presence of bacterial infection. Among the clinical isolates of asymptomatic bacteriuria, gram negative isolates were more than gram positive. These clinical isolates are highly resistant to various antibiotics (Ciprofloxacin, Ofloxacin, Gentamicin and Cefotaxime) in clinical practice while, most of them are sensitive to Amikacin and Cephaperazone±sulbactam. Statistical analysis indicates that there is a highly significant relationship between the bacteriuria and leucocyturia, followed by significant association between bacteriuria and proteinuria, bacteriuria and glucosuria and as well as bacteriuria with nephropathy.

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