

ASYMPTOMATIC PYURIA AMONG DIABETICS IS A GROWING YET AN IGNORED CONCERN: AN EXPLORATORY STUDY FROM RURAL SOUTH INDIA

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Abstract: Asymptomatic pyuria among diabetics is a condition which is largely undiagnosed and hence ignored in India. A community based cross sectional study was carried out to measure the prevalence of asymptomatic pyuria among diabetics in Vellore district of Tamilnadu. A total of 117 study participants were selected through systematic random sampling method. Among all diabetic patients, 26.5% were found to have asymptomatic pyuria who were either nitrite or leukocyte esterase positive. It was also noticed that more than 20% were males which suggest that not only females but males were also at a risk of getting asymptomatic pyuria, possibly related to old age.

Keywords: Diabetes, Pyuria, UTI, Nephropathy.

1. INTRODUCTION

India is considered as the diabetes capital of the world with 40.9 million currently being affected with diabetes mellitus.(1) Even though it is believed that diabetics are predisposed to recurrent infections, only bacteriuria can be recorded as occurring in increased frequency among diabetics as compared to non diabetics.(2) Asymptomatic Bacteriuria (ASB) is often neglected problem among both patients and health provider. It is more common among females than in males. There is roughly five-fold greater propensity toward Urinary Tract Infection (UTI) in diabetic women (3). Asymptomatic Bacteriuria often precedes symptomatic UTI in type 2 diabetes (relative risk [RR] 1.65, 95 percent confidence interval [CI] 1.02-2.67).(4) UTIs are likely to be more severe in diabetic than non diabetic women.(5) Among diabetic women, Approximately three to four fold increase in risk of bacteriuria (18% versus 6% , 26% versus 6 %).(6) It also increases the risk of subsequent symptomatic UTI(7) It is also found that diabetics with ASB are more at a risk for albuminuria and symptomatic urinary tract infections (8). They are prone for severe infections like emphysematous pyelonephritis, papillary necrosis, perinephric abscess and candidial pyelonephritis.(2)

Prevalence of Asymptomatic bacteriuria is common among elderly patients in the community, residential aged care facilities and in the hospital setting. The prevalence of ASB increases with age, ranging from 0% in men aged 68–79 years to 5.4% in men aged 90–103 years (9). This rising prevalence is even more pronounced in women, increasing from 13.6% to 22.4% (10).

Present study aims to measure the prevalence of asymptomatic bacteriuria and pyuria, diagnosed using urine dipstick among diabetics aged 18 years and above in k v Kupparam block, Vellore district of Tamilnadu.

2. MATERIALS AND METHODS

During the period from Aug 2014 to Sept 2014, a community based cross sectional study had been carried out in one of the blocks of Vellore District, Tamilnadu. Through systematic multistage random sampling seven villages were selected. Based on assumption of 17% prevalence and taking 7 as absolute precision, Total sample size of study was 117 diabetic patients. Consent form was prepared, translated and back translated in both English and Tamil. All those who were 18 and

above, gave written consent and having diabetic for at least 6 months were included in the study. All the patients on catheter, pregnant diabetic mothers and gestational diabetes were excluded from the study. Written consent was taken and questions were asked from Interviewed administered semi structured questionnaire. Blood samples were collected and Random blood sugar was checked using glucometer at field site. Urine specimen collected using mid stream clean catch was tested using urine multi stick to look for nitrite and leukocyte esterase positivity which was an indicator of pyuria and bacteria. Those who were found to be either nitrite positive or leukocyte esterase positive or both with symptoms of urinary tract infection (UTI) like fever, lower abdominal pain, vomiting etc where referred to hospital. Data was entered using epidata 3.1 and was analyzed by Statistical Package For Social Science (SPSS) 20. For all the analysis purpose, significance level was set as $P < 0.05$.

3. RESULTS

The study had 117 participants out of which 59% (69) were female. The mean age of the participants was 57. Majority of them, 90 % (111), were compliant to drug proper drug intake. Further details of the baseline characteristics were given in table 1.

Table 1: Baseline characteristics of study population (n=117)

Variable	Categories	Number (%) n=117
Age	Less than 57	65 (55.6%)
	More than 57	52 (44.4%)
Sex	Male	48 (41%)
	Female	69 (59%)
Education status	Primary and less	54 (46.2%)
	Middle and high	63 (53.8%)
Occupation	Unskilled and less	101(86.3%)
	Skilled and more	16 (13.7%)
Drug compliance	Yes	111(94.9%)
	No	6 (5.1%)
Duration of diabetes	5 years and less	80 (68.4%)
	More than 5 years	37 (31.6%)
Mode of treatment	One drug	45 (38.5%)
	Two drug	67 (57.3%)
	Insulin	10 (8.5%)
Last sugar check up	Less than 3 months	82(70.1%)
	3 months and more	35 (29.9%)
Presence of co morbidities	Yes	65 (55.6%)
	No	52 (44.4%)

Among all study population, 8.5 % (10) had previous history of UTI and 7.7% (9) had at least one symptom of UTI. 5.1% had nitrite positive and 25.6% had leukocyte esterase positive. The prevalence of probable pyuria; that is either nitrite or leukocyte esterase positive were 26.5%. The blood and urine characteristic of the population is given in Table 2.

Table 2: Blood and urine characteristics of study population (n=117)

Variable	Categories	Number (%) n=117
GRBS Value	Less than 200	68 (58.1%)
	200 and more	49 (41.9%)
Nitrite test	Positive	6 (5.1%)
	Negative	111(94.9%)
leukocyte esterase test	Positive	30 (25.6%)
	Negative	87 (74.4%)
Previous history of UTI	Yes	10(8.5%)
	No	107(91.5%)
Participant who had at least one symptom of UTI	Yes	9 (7.7%)
	No	108 (92.3%)

Logistic regression was done to find the association between probable pyuria and different risk factors like age, gender, education and duration of disease. Among those who had probable pyuria nearly 78% were women. The women having pyuria is 5.15 times (95%CI 1.69-15.89, (p 0.004) higher than the odds of men having pyuria. Only 7 men were diagnosed to have probable pyuria out of which 6 belonged to the age group 57 years and above. Older age group has 5 times more risk of having pyuria compared to younger age group. (p0.002) No statistically significant association was noticed between probable pyuria and educational status and duration of disease. The details are given in table 3.

Table 3: Various risk factors for probable pyuria

Categories		Probable pyuria	No pyuria	Chisquare (p value)	Odds ratio (95% CI)	P value
Age	>57yrs	20(38.5%)	32(61.5%)	6.881 (0.009)	5.18(1.69-15.89)	0.004
	<=57yrs	11(16.9%)	54(83.1%)			
Gender	Female	24(34.8%)	45(65.2%)	5.93(0.02)	4.91(1.78-13.52)	0.002
	Male	7(14.6%)	41(85.4%)			
Education	Primary and less	17(32.7%)	35(67.3%)	1.85(0.174)	1.21(0.45-3.25)	0.07
	More than primary	14(21.5%)	51(78.5%)			
Duration of disease	More than 5 years	10(27%)	27(73%)	0.008(0.93)	1.08(0.41-2.83)	0.87
	Less than 5 years	21(26.2%)	59(73.8%)			

4. DISCUSSION

The study was carried out in one of the rural block in Vellore district of Tamilnadu. This rural block has 2 PHCs (primary health centre) and one private secondary level hospital providing healthcare. There are regular non communicable disease camps and mobile clinics conducted in this area by these health care providers. Patients are being educated intermittently about diabetes, its commonly faced complications and the necessary precaution that needed to be taken to prevent its occurrence. This study was carried out to identify the prevalence of one of the commonly seen condition, pyuria among this population. A community based cross sectional study was carried using urine dipstick which would measure both nitrite level and leukocyte esterase level in urine. Enterobacteriaceae which is one of the common causes of UTI produce nitrite from nitrate which can be detected using dipstick. Similarly, the leukocyte esterase test identifies the esterase produced by the neutrophils, both intact and lysed. Positive nitrite and leukocyte esterase test is indication of pyuria. It is not a confirmatory though. The gold standard for confirming pyuria is urine culture test, which is very expensive and not feasible in a setting where this study has been carried out. Studies have shown the sensitivity and specificity of leukocyte esterase and / or nitrite test is 67 to 100% and 67% to 98% respectively.(11) True prevalence can be calculated using the formula (apparent prevalence + specificity -1)/(sensitivity+ specificity-1). The apparent prevalence of pyuria using urine dip stick is 26.5%. Thus the true prevalence will be between 19.1% and 25%. Pyuria was found to be more among women and older age group. The female preponderance is primarily attributed to long term disease and long term compliance to medicines than with metabolic parameters of diabetes control. (12) Men are less prone to pyuria but the prevalence increases with age and this could be because of obstructive uropathy and voiding dysfunction associated with prostatic hypertrophy. (12) .

5. CONCLUSION

Present study show that only 58% of subjects show adequate control of blood sugar. Increase in prevalence of asymptomatic pyuria among male diabetics especially in the older age group, is a matter of great concern in the Indian setting. The prevalence of probable asymptomatic pyuria among diabetics was found to be 26.5%. The study has been carried out in an area which has a proper access to the health care system. Awareness regarding early check up and self care need to be improved in this area. Proper awareness among health providers and diabetics are absolute essential. Otherwise it may lead to other complications. It also necessitates the further studies in the field of asymptomatic bacteriuria and pyuria in rural areas.

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