

Asymptomatic Bacteriuria in Patients with Diabetes Attending a Tertiary Care Level – A Descriptive Study

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ABSTRACT

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Background: Most of the major cancer centres have adopted sentinel lymph node biopsy (SNLB) as standard means of axillary nodal assessment as an alternative to axillary lymph node dissection (ALND) in clinically node negative early breast cancers. The benefits of SNLB is to reduce the functional disability which is a potential consequence of ALND. A major pitfall of SNLB is the potential of false negative rate which will increase the risk of an axillary recurrence.

Methods: This is a pilot study of forty one cases of clinically N0, T1 and T2 tumors for whom sentinel lymph node mapping was done using methylene blue dye to detect occult metastasis. This was validated by complete ALND in all cases.

Results: The calculated accuracy of the frozen section analysis was 97.5%, sensitivity was 85.7% and specificity was 100%. Positive predictive value was 100%, negative predictive value was 97.14% and false negative rate was 2.86%

Discussion & Conclusion: This study demonstrates a high sensitivity and specificity for frozen sections of SNLB with an accuracy of 96%.

Keywords: Frozen section, Sentinel lymph node, Methylene blue dye, Early breast cancer

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BACKGROUND

Patients with diabetes mellitus (DM) are more prone to infection, and the urinary tract is one of the most commonly affected sites.^{1,2} Asymptomatic bacteriuria may lead to albuminuria and urinary tract infection, and may warrant treatment in diabetics.³ Additionally, certain organisms have a predilection for infecting the genitourinary tract of the diabetic patient.⁴ The mechanism of pathogenesis for this association between DM and urinary tract infections (UTI) is not completely clear. However, it is suspected that the high glucose concentration in the urine of these patients may favour the growth of uropathogens.⁵ Asymptomatic bacteriuria is far more common in women than in men. Also, in women, this condition is commoner in diabetics, than in those without the disease. Anatomic and physiologic factors (such as a short urethra) are responsible for the higher susceptibility of females to these infections.⁶

It is not completely clear if symptomatic UTIs are preceded by asymptomatic bacteriuria.³ However, a study from Netherlands clearly shows that women

with type 2 DM are more likely to proceed from asymptomatic bacteriuria to symptomatic UTI.⁷ Complications from UTI, such as bacteremia, renal abscesses and renal papillary necrosis, are seen more commonly in patients with DM than in individuals without DM.⁸ Additionally, renal involvement even without the presence of symptoms (such as subclinical pyelonephritis) is commoner in patients with DM.⁹ So, detection of UTI in diabetics becomes very important.

Asymptomatic bacteriuria is one of the clinical manifestations of UTI. It is defined as persistently and actively multiplying bacteria in significant numbers (more than 10,000 per millilitre) within the urinary tract without any obvious symptoms.⁶ Asymptomatic bacteriuria is common in neonates, preschool children, pregnant women, elderly people, diabetics, catheterized patients and patients with abnormal urinary tracts or renal disease.⁶ Though there is currently no consensus on treatment of asymptomatic bacteriuria in various population groups, it is advisable to treat asymptomatic bacteriuria in DM, as these patients may progress to symptomatic UTI or develop complications of UTI.

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This study attempts to estimate the prevalence of asymptomatic bacteriuria among patients with DM attending a tertiary care centre, and to identify other risk factors for this condition.

MATERIALS AND METHODS

This is a hospital-based descriptive study. The study included patients attending the diabetic out-patient clinic in Rajah Muthiah Medical College, Annamalai University, between August 2012 to April 2013, and was commenced after obtaining the necessary permission from the institution ethics committee. To be included in the study, they had to conform to the WHO criteria for diagnosis of DM.¹⁰ Patients with history of urogenital symptoms, prior bladder catheterisation and instrumentation or surgery of the urogenital tract were excluded from the study. A detailed physical examination of the potential subjects of this study was then carried out, and patients found to have any urogenital abnormalities, including, but not limited to prostatic enlargement (in males) or cystocoele (in females) were excluded from the study. The first 50 males and the first 50 females who satisfied these criteria were then included in the study.

Mid-stream urine samples were collected from these patients, and subjected to microscopic examination and culture. Urine was collected from the female subjects during their non-menstrual periods. Culture was done using the semi-quantitative calibrated loop technique.¹¹ Culture plates were read after 24 hours of incubation, and number and type of colonies were estimated in plates with growth. Plates with no growth were reincubated for an additional 24 hours, and checked again for growth. The isolate was then identified and tested for antibiotic susceptibility using standard microbiological techniques.

Isolation of the same strain of bacterium from two consecutive samples of urine with quantitative counts greater than 105 colony forming units per millilitre in females, and growth of a single type of organism with quantitative count greater than 105 colony forming units per millilitre in males, was taken as evidence of asymptomatic bacteriuria.⁶ The data was analysed using the statistical software R (version 2.14.1).

RESULTS

Out of the 100 patients in the study group, 42 were found to have asymptomatic bacteriuria.

Among these, 27 (64.29%) were female and 15 (35.71%) were male. Thus, the occurrence of asymptomatic

Table 1. Age-distribution of positive cases

Age (years)	Patients with asymptomatic bacteriuria	Percentage
10 – 20	3	7.14
21 – 30	3	7.14
31 – 40	7	16.67
41 – 50	10	23.81
51 – 60	13	30.95
>60	6	14.29

bacteriuria among female diabetics in the study group was 54%, as opposed to 30% in males. This difference was found to be statistically significant ($p = 0.026$) using Pearson's Chi-squared test. 30% of the positive cases were in the age-group of 51-60 years. **Table 1** gives the age-distribution of the positive cases.

DISCUSSION

This study clearly demonstrated a high occurrence of asymptomatic bacteriuria in diabetics (42%). This is in concurrence with a meta-analysis study published in 2011, which showed a similar rate among diabetics.¹²

Additionally, the female diabetic was found to have a significantly higher prevalence of asymptomatic bacteriuria (54%) than her male counterpart (30%). This is reflected in many other studies as well.¹²⁻¹⁴ Furthermore, the female sex has been deemed as an independent risk factor for asymptomatic bacteriuria, regardless of the presence of DM, by these studies.

Treatment of these patients with asymptomatic bacteriuria remains an open question. As per current guidelines, antibiotic therapy of asymptomatic bacteriuria is definitely indicated only in pregnancy, renal transplant and before an invasive genitourinary procedure.⁶ However, considering the fact that many of these patients (especially females) with asymptomatic bacteriuria proceed to symptomatic UTI,⁷ and that UTI in diabetic patients are more likely to cause complications than in non-diabetic patients,⁹ asymptomatic bacteriuria in DM may warrant antibiotic therapy. Indeed, a review article on the subject proposes that such cases may possibly benefit from treatment.¹⁴

CONCLUSION

The occurrence of asymptomatic bacteriuria in the study population was 42%. Female sex found to be a significant risk factor in developing asymptomatic bacteriuria. Diabetics with asymptomatic bacteriuria may benefit from antibiotic therapy, considering their propensity to progress to symptomatic UTI, and to develop complications from UTI.

END NOTE

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