

Evaluation of Prevalence of Asymptomatic Bacteriuria in Female Type 2 Diabetics Patients: An Institutional Based Study

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ABSTRACT

Background: Diabetes mellitus (DM) is probably one of the oldest diseases known to man. Type 2 diabetes mellitus (T2DM) is an expanding global health problem. Growth of bacteria in the urine without any complaints (asymptomatic bacteriuria) is commonly detected in women up to 60 years, people with diabetes and in the elderly. Hence, the present study was conducted for assessing the prevalence of asymptomatic bacteriuria in females suffering from type 2 diabetes mellitus.

Materials & Methods: A total of 200 female subjects with presence of type 2 diabetes mellitus was enrolled. Complete demographic and clinical details of all the subjects were obtained. A Performa was made and the detailed medical history of all the patients was recorded. Urine specimens of 5 to 10 ml collected from each subject were examined microscopically for white blood cells, red blood cells and bacteria. The specimens were further cultured on MacConkey agar using a sterile bacteriological loop that delivered 0.002 ml of urine. Colony counts yielding bacterial growth of more than 10^5 /ml of pure isolates were considered significant. The occurrence of ABU was evaluated. All the results were evaluated using SPSS software.

Results: A total of 200 subjects were analyzed. The mean age of the subjects was 39.3 years. Out of 200 subjects, ABU was seen in 60 subjects. Hence, the overall prevalence of ABU was 30 percent. While assessing the correlation of glycemic profile and occurrence of ABU, significant results were obtained.

Conclusion: There is a high occurrence of ABU among female diabetic subjects.

Key words: Asymptomatic Bacteriuria, Diabetes.

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INTRODUCTION

Diabetes mellitus (DM) is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago. In 1936, the distinction between type 1 and type 2 DM was clearly made. Type 2 DM was first described as a component of metabolic syndrome in 1988. Type 2 DM (formerly known as non-insulin dependent DM) is the most common form of DM characterized by hyperglycemia, insulin resistance, and relative insulin deficiency. Type 2 DM results from interaction between genetic, environmental and behavioral risk factors. People living with type 2 DM are more vulnerable to various forms of both short- and long-term complications, which often lead to their premature death. This tendency of increased morbidity and mortality is seen in patients with type 2 DM because of the commonness of this type of DM, its insidious onset and late recognition, especially in resource-poor developing countries like Africa.¹⁻³ Type 2 diabetes mellitus (T2DM) is an expanding global health problem, closely linked to the epidemic of obesity.

Individuals with T2DM are at high risk for both microvascular complications (including retinopathy, nephropathy and neuropathy) and macrovascular complications (such as cardiovascular comorbidities), owing to hyperglycaemia and individual components of the insulin resistance (metabolic) syndrome. Environmental factors (for example, obesity, an unhealthy diet and physical inactivity) and genetic factors contribute to the multiple pathophysiological disturbances that are responsible for impaired glucose homeostasis in T2DM.^{4,5}

Growth of bacteria in the urine without any complaints (asymptomatic bacteriuria) is commonly detected in women up to 60 years, people with diabetes and in the elderly. It is not clear whether antibiotic treatment for this condition is of benefit for non-pregnant adults.^{6,7}

Hence, the present study was conducted for assessing the prevalence of asymptomatic bacteriuria (ABU) in females suffering from type 2 diabetes mellitus.

MATERIALS & METHODS

A total of 200 female subjects with presence of type 2 diabetes mellitus was enrolled in Department of General Medicine, Krishna Mohan Medical College and Hospital, Mathura, Uttar Pradesh, India. Complete demographic and clinical details of all the subjects was obtained. A Performa was made and the detailed medical history of all the patients was recorded. Urine specimens of 5 to 10 ml collected from each subject were examined microscopically for white blood cells, red blood cells and bacteria. The specimens were further cultured on MacConkey agar using a sterile bacteriological loop that delivered 0.002 ml of urine. Colony

counts yielding bacterial growth of more than 10^5 /ml of pure isolates were considered significant. The occurrence of ABU was evaluated. All the results were evaluated using SPSS software.

RESULTS

A total of 200 subjects were analyzed. The mean age of the subjects was 39.3 years. Out of 200 subjects, ABU was seen in 60 subjects. Hence, the overall prevalence of ABU was 30 percent. While assessing the correlation of glycemic profile and occurrence of ABU, significant results were obtained.

Table 1: Prevalence of ABU

ABU	Number	Percentage
Present	60	30
Absent	140	70
Total	200	100

Table 2: Correlation of ABU and glycemic profile

ABU	Pearson's correlation	p-value
Number	2.338	0.001 (Significant)

DISCUSSION

Approximately 25.8 million people in the U.S. (8.3% of the population) are affected by type-2 diabetes mellitus. Even more concerning is that about 79 million adults 20 years of age or older have prediabetes, defined as a glycosylated hemoglobin (HbA1c) level ranging from 5.7% to 6.4%, and are at risk for the disease. Type-2 diabetes carries significant morbidity and is the leading cause of kidney failure, lower-limb amputations, and new cases of adult blindness. Moreover, it is the seventh leading cause of death in the U.S., primarily as a result of cardiovascular morbidity. In terms of financial burden, total direct and indirect costs of the disease are projected to reach \$336 billion annually. Despite the significant morbidity and mortality associated with this disease, treatment failure (i.e., not achieving goal HbA1c) is common, with one study reporting a failure rate of 63%.⁶⁻⁸

Several factors make urinary tract infection (UTI) a relevant condition of the gestational period with significant maternal and perinatal adverse effects. Symptomatic and asymptomatic UTIs are common in pregnancy. For many years, pregnancy has been considered a factor predisposing to all forms of UTI. Today, however, it is known that pregnancy as an isolated event is not responsible for a higher incidence of UTI. Bacteriuria is defined as the presence of bacteria in urine. Diagnosis of asymptomatic UTI is conducted mainly by the microbiological method. A patient is said to have asymptomatic UTI when there is significant bacteriuria without obvious clinical manifestations. Significant bacteriuria is defined as a urine sample containing more than 10^5 colonies/ml of urine (10^8 /L) in pure culture using a standard calibrated bacteriological loop.^{9,10} Hence; the present study was conducted for assessing the prevalence of asymptomatic bacteriuria in females suffering from type 2 diabetes mellitus.

A total of 200 subjects were analyzed. The mean age of the subjects was 39.3 years. Out of 200 subjects, ABU was seen in 60 subjects. Hence, the overall prevalence of ABU was 30 percent. While assessing the correlation of glycemic profile and occurrence of ABU, significant results were obtained. Kehinde AO et al, in another previous study assessed 473 subjects. 136 had significant bacteriuria, giving a prevalence rate of 28.8%. The highest age specific prevalence (47.8%) was found in the 25–29-year-olds while only one (0.7%) was found in the teenage group. A large percentage (64.0%) of subjects with significant bacteriuria had tertiary education, compared with 4.4% who had no formal education, but the association was not statistically significant. The majority (75.8%) of subjects with significant bacteriuria had no previous history of abortion, while 20 (14.7%) had one previous abortion and only three (2.1%) admitted to three previous abortions. The majority (69.8%) of those with significant bacteriuria presented at second trimester while 38 (28.0%) presented at third trimester ($X^2 = 6.5$, $p = .37$). Only 22 (4.6%) of the studied subjects presented at first trimester, and 3 (13.7%) of these had significant bacteriuria. The prevalence of asymptomatic bacteriuria is high among the study population.¹¹ Turpin C et al determined the prevalence of asymptomatic bacteriuria in pregnant women attending antenatal clinic. Samples of 10-15ml urine were examined for pus cells, bacteria and parasitic ova. The samples were further cultured on cysteine lactose electrolyte deficient agar and colony counts yielding bacterial growth of 10^5 /ml or more of pure isolates were deemed significant. Of the 220 pregnant women, 16 had significant bacteriuria giving a prevalence rate of 7.3%. The highest age-specific prevalence was found in the 35-39 year-olds (13%) and the lowest in the 15-19

year-olds (0.0%). There was no significant difference in prevalence with increasing parity. The dominant bacteria isolates were *E. coli* (37%) and *Staph aureus* (31%). The prevalence of asymptomatic bacteriuria in pregnant women at KATH is 7.3%.¹²

CONCLUSION

There is a high occurrence of ABU among female diabetic subjects.

REFERENCES

1. Patlak M. New weapons to combat an ancient disease: treating diabetes. *FASEB J* 2002. Dec;16(14):1853
2. Maitra A, Abbas AK. Endocrine system. In: Kumar V, Fausto N, Abbas AK (eds). *Robbins and Cotran Pathologic basis of disease* (7th ed) 2005. Philadelphia, Saunders; 1156-1226.
3. Azevedo M, Alla S. Diabetes in sub-saharan Africa: kenya, mali, mozambique, Nigeria, South Africa and zambia. *Int J Diabetes Dev Ctries* 2008. Oct;28(4):101-108
4. Camastra S, Bonora E, Del Prato S, Rett K, Weck M, Ferrannini E, EGIR (European Group for the Study of Insulin Resistance) Effect of obesity and insulin resistance on resting and glucose-induced thermogenesis in man. *Int J Obes Relat Metab Disord* 1999. Dec;23(12):1307-1313
5. Alberti KG, Zimmet P, Shaw J, IDF Epidemiology Task Force Consensus Group The metabolic syndrome—a new worldwide definition. *Lancet* 2005. Sep;366(9491):1059-1062
6. Nicolle LE, Zhanel GG, Harding GK. Microbiological outcomes in women with diabetes and untreated asymptomatic bacteriuria. *World Journal of Urology* 2006;24(1):61-5.
7. Renneberg J, Paerregaard A. Single-day treatment with trimethoprim for asymptomatic bacteriuria in the elderly patient. *Journal of Urology* 1984;132(5):934-5.
8. Powers AC. Diabetes mellitus. In: Fauci AS, Braunwauld E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J (eds). *Harrison's Principles of Internal Medicine*. 17th ed, New York, McGraw-Hill; 2008: 2275-2304.
9. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. U.K. Prospective Diabetes Study Group. *BMJ*. 1998;317:703–713.
10. Montori VM, Fernandez-Balsells M. Glycemic control in type 2 diabetes: Time for an evidence-based about-face? *Ann Intern Med*. 2009;150:803–808.
11. Lehman R, Krumholz HM. Tight control of blood glucose in long standing type 2 diabetes. *BMJ*. 2009;338:b800.
12. Kehinde, A. O., Adedapo, K. S., Aimaikhu, C. O., Odukogbe, A. T., Olayemi, O., & Salako, B. Significant bacteriuria among asymptomatic antenatal clinic attendees in ibadan, Nigeria. *Tropical medicine and health* 2011; 39(3), 73–76. <https://doi.org/10.2149/tmh.2011-02>
13. Turpin C, Minkah B, Danso K, Frimpong E. Asymptomatic bacteriuria in pregnant women attending antenatal clinic at komfo anokye teaching hospital, Kumasi, Ghana. *Ghana Med J*. 2007;41(1):26-29.

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