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Family Physician Corner

Preliminary Report
Albuminuria among Patients with Type 2 Diabetes Mellitus in a Primary Care Setting in the Kingdom of Bahrain: Prevalence, Risk Factors and Patterns of Treatment - A Cross-Sectional Study

Rabha Salman, MD, FAM. MED*

Type 2 diabetes is a serious metabolic disease, which is becoming increasingly common worldwide. Diabetic patients are at risk of developing serious long-term microvascular and macrovascular complications. Among all the complications of diabetes mellitus, nephropathy is the diabetes-specific complication with the greatest mortality[1]. Micro-albuminuria appears to be the earliest sign and a strong predictor of the subsequent diabetic renal disease and is a marker of increased cardiovascular morbidity and mortality in diabetes[2,3]. In line with the importance of epidemiological data of diabetes complications, such as prevalence rates in creating preventive, planning and control strategies in the health service; the present study; therefore, aims to estimate the prevalence, risk factors and patterns of management of microalbuminuria in type 2 diabetes patients in a primary care setting in Bahrain[4]. This study was submitted by the Author as part of dissertation for Master Program in diabetes care at Warwick Medical School. A preliminary report of the results of this study is discussed here.

Type 2 diabetes is a serious metabolic disease, which is becoming increasingly common worldwide; currently, 171 million people are known to have diabetes. The number is expected to rise to 366 million by 2030, half will be Asian and of those that have the disease, approximately 95% have type 2 diabetes[5,6,7]. In Bahrain, diabetes is becoming an extremely common disorder. Based on the world Health Organization (WHO) criteria of 1985, a study in Bahrain 1995, found that the prevalence of diabetes in the population aged thirty years and above was 21.1 percent known diabetics, 8.5 percent newly discovered as diabetics, and an additional 14.8 percent with impaired glucose tolerance test (IGT). This gives a prevalence rate of 44.4 percent including IGT[8]. A similar study in 1996 revealed nearly the same prevalence[9]. Statistics from WHO predict that number of diabetics in Bahrain will triple by year 2025[5].

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* Consultant Family Physician & Diabetologist
Mohammed Bin Jassim Kanoo Health Centre
Primary Care Directorate
Ministry of Health
Kingdom of Bahrain

Diabetic patients are at risk of developing serious long-term microvascular and macrovascular complications, giving rise to considerable public health problems and may present a challenge to the health care system. Diabetes was found to be the leading cause of renal failure, the second commonest cause of lower limb amputation, and the leading cause of blindness in working age group[10-13].

Among all the complications of diabetes mellitus, nephropathy is the diabetes-specific complication with the greatest mortality[1]. Micro-albuminuria appears to be the earliest sign and a strong predictor of the subsequent development of overt diabetic nephropathy[2,3]. Besides being a predictor of incipient nephropathy, microalbuminuria is also a marker of greatly increased cardiovascular morbidity and mortality in patients with type 1 or type 2 DM. Microalbuminuria is thus an indicator of possible vascular disease and require aggressive intervention to reduce cardiovascular risk[14].

Because of the adverse impact of microalbuminuria and proteinuria on survival in patients with type 2 diabetes mellitus, and due to its reversibility through early treatment, screening and intervention programmes should be timely implemented, at the stage of microalbuminuria. Annual screening for microalbuminuria is recommended by international guidelines[3,14-17].

The National Institute of Clinical Excellence (NICE) and ADA recommend an annual screening and strict intervention in case of microalbuminuria in type 2 diabetes[3,18]. In Bahrain, one would like to know how far the current situation is in primary care setting in regards to these guidelines. The high prevalence of diabetes in small country with limited resources for health services such as Bahrain makes high demand on the health services and any reduction in morbidity (such as albuminuria and its consequences) through proper interventional programmes, could reduce that burden.

In 2003, a study by the author was conducted to examine the level of the diabetic care delivered to 430 patients in one of the governmental primary health centers in Bahrain[13]. It was concluded that the level of diabetic service provision in the studied health centre was below the recommended standard of Bahrain's Diabetic Committee, National Health Service (NHS), and American Diabetic Association (ADA). The control of diabetes and its associated co-morbidities (hypertension and dyslipidemia) were suboptimal. Obesity, foot, eye and renal diseases screening were rarely performed for diabetic patients.

In 2006, another study was done by the author (submitted as partial fulfillment of a master degree in diabetes care) to find out the prevalence of albuminuria in type 2 diabetes, its risk factors and the patterns of management of those who were already known to be albuminuric at the time of the study. The preliminary results of this study showed that, out of the 702 subjects, 196 (27.9%) were albuminuric. The prevalence of microalbuminuria and macro-albuminuria was 22.0% (n = 155) and 5.8% (n = 41), respectively. Most of the patients with albuminuria were at high risk of cardiovascular diseases. The recommended BP target is less than 130/80 mmHg and glycosylated haemoglobin (HbA1c) is less than 7%, they were achieved in 17.3% and 13.8%, of the

albuminuric subjects respectively. The under-screening of renal disease found in 2003 could be a contributing factor to the high prevalence rate of albuminuria in this study[13]. It is reflecting the suboptimal level of diabetic care delivered to these patients.

Further analysis of the data showed that significant associations do exist between albuminuria and age of more than 65 years, long duration of diabetes, high HbA1c, high triglycerides, total and LDL cholesterol, systolic BP more than 160 mmHg, diastolic BP more than 90 mmHg and retinopathy at univariate analysis level. On the other hand, multivariate analysis using logistic regression model showed that high HbA1c, high systolic BP and long duration of diabetes, were significant predictors of albuminuria, while older age, male gender and high triglycerides were borderline. Poor glyceamic and blood pressure control were the dominant modifiable predictors for albuminuria development and these in fact were directly related to the suboptimal service.

In the same study, the patterns of treatment were further analyzed; it revealed that more patients were on antihypertensive monotherapy than on combination therapy (45.1% vs.26.8%; P = 0.01). ACEIs prescribed to only 34.7 % of the subjects. The recommended two and three antihypertensive drugs combination were less often prescribed. For diabetes treatment, two drugs combination was significantly higher in the albuminuric patients compared to the other options (55.1% vs. 36.2, $p<0.01$). Inappropriate prescribing practices, such as frequent use of sulphonylurea instead of metformin in obese patients, and rarely prescribing insulin despite the maximum dose of oral hypoglycaemic agents (OHA) in uncontrolled subjects were observed. Lipid-lowering (35.2%) and antiplatelet (33.2%) drugs were underutilized.

CONCLUSION

Microalbuminuria is the earliest sign of diabetic renal disease and is a marker of increased cardiovascular morbidity and mortality in diabetes. The preliminary results of Bahrain Albuminuria Study in type 2 diabetes indicated that the prevalence of albuminuria is high but comparable to what is known in other communities. It indicates the high rate of potential renal failures in the future, which can add a burden on the renal dialysis unit within the coming 10 years.

Hypertension and diabetes in albuminuric subjects treated at the primary care diabetic clinics were inadequately controlled. On several occasions, mono and combination antihypertensives and antidiabetics use were inappropriate. Lipid-lowering and anti-platelets risk reduction strategies have received little attention.

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