

Assessment of risk factors for diabetic nephropathy among newly diagnosed Type 2 diabetic subjects: A pilot study

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Abstract:

Background: The prevalence of diabetes mellitus (DM) is expanding all through the world and this burden of disease is generally contributed by the expanding cases of type 2 DM (T2DM). DM is the main cause of chronic kidney disease (CKD) in developed nations and is quickly turning into the main cause for CKD in developing countries. **Material & Methods:** The present case-control study was conducted at department of Department of Medicine of our tertiary care hospital. The study duration was of one year. Patients were enrolled from outdoor and from ward by simple random sampling. Recently diagnosed (<3 months), adults (>18 years), T2DM patients were enrolled in the present study. **Results** The age of study participants was ranged from 34 years to 76 years. The mean age of cases was 48.4 ± 2.9 years and mean age of controls was 44.4 ± 2.1 years. Out of total study participants it was reported that males 54% were likely affected more than females 46% in cases while among controls 48% were males and 52% were females. The mean BMI of cases was 26.6 ± 3.47 and mean BMI of controls was 24.6 ± 2.41 . Family history of diabetes mellitus was present in all 30 cases whereas it was present in 20 controls. Family history of diabetic nephropathy was found in 16 patients and 4 controls. Mean fasting blood glucose (mmol/L) was 9.90 ± 1.89 mmol/L among cases and among controls mean fasting blood glucose (mmol/L) was 8.43 ± 3.28 mmol/L. Mean blood glucose after 2 hours (mmol/L) was 15.11 ± 2.52 among cases and among controls mean blood glucose after 2 hours (mmol/L) was 12.61 ± 4.72 mmol/L. Mean HbA1c (%) was 8.18 ± 1.11 among cases and among controls mean HbA1c (%) was 6.95 ± 1.44 . **Conclusion:** In the present study, hypertension was present as risk factor among 22 cases and among 22 controls. Dyslipidemia was present as risk factor among 24 cases and among 9 controls. Smoking was present as risk factor among 11 cases and among 8 controls.

Keywords: diabetes mellitus, chronic kidney disease, diabetic nephropathy.

Introduction:

The prevalence of diabetes mellitus (DM) is expanding all through the world and this burden of disease is generally contributed by the expanding cases of type 2 DM (T2DM) (1). DM is the main cause of chronic kidney disease (CKD) in developed nations (3) and is quickly turning into the main cause for CKD in developing countries (4). Patients with T2DM go through pre-diabetic stages [impaired fasting glucose (IFG) and impaired glucose tolerance (IGT)] and half of the T2DM patients remain undiagnosed (5). During the disease progression, one third to half of the T2DM patients may have macro-vascular and micro-vascular complexities including diabetic nephropathy (6). Data related to such complications and related risk factors among the study area population are inadequate (7). For this purpose, the current study was conducted to assess risk factors for diabetic nephropathy among recently diagnosed T2DM subjects.

Materials and Methods

The present case-control study was conducted at department of Department of Medicine of our tertiary care hospital. The study duration was of one year. Patients were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. Recently diagnosed (<3 months), adults (>18 years), T2DM patients were enrolled in the present study.

All study participants who went through test for urine albumin-to creatinine ratio, at least two times, at 6 weeks apart, in a period of 6-month, were enrolled for the study. Patients with already diagnosed kidney diseases or had features of glomerulonephritis, patients with systemic diseases like vasculitis or systemic lupus erythematosus, patients with history of recent fever and urinary tract infection and pregnancy were excluded from the study. Patients with urine albumin-to creatinine ratio ≥ 30 mg/g in at least two of three (if done) samples were enrolled as cases and those with urine albumin-to creatinine ratio < 30 mg/g were enrolled as controls. The test of significance of contrast between two groups was utilized to decide the measurable centrality of the information by applying the t test at alpha 0.5 and 95% confidence interval.

Results

In present study, we enrolled 60 study participants, out of them 30 were cases and 30 were controls. Patients with urine albumin-to creatinine ratio ≥ 30 mg/g in at least two of three (if done) samples were enrolled as cases and those with urine albumin-to creatinine ratio < 30 mg/g were enrolled as controls. Study participants were enrolled from outdoor and from ward by simple random sampling. The age of study participants was ranged from 34 years to 76 years. The mean age of cases was 48.4 ± 2.9 years and mean age of controls was 44.4 ± 2.1 years. Out of total study participants it was reported that males 54% were likely affected more than females 46% in cases while among controls 48% were males and 52% were females. The mean BMI of cases was 26.6 ± 3.47 and mean BMI of controls was 24.6 ± 2.41 . Family history of diabetes mellitus was present in all 30 cases whereas it was present in 20 controls. Family history of diabetic nephropathy was found in 16 patients and 4 controls. (Table 1)

Table 1: Distribution of study subjects according to the age, gender and BMI.

Study parameters		Cases (n=30)	Controls (n=30)
Mean age		48.4 ± 2.9 years	44.4 ± 2.1 years
Gender	Male	54%	48%
	Female	46%	52%
BMI (Kg/m ²)		26.6 ± 3.47	24.6 ± 2.41
Family history of diabetes mellitus		30 patients	20 patients
Family history of diabetic nephropathy		16 patients	4 patients

In the present study out of the total study participants, hypertension was present as risk factor among 22 cases and among controls hypertension was present as risk factor among 22 participants. Dyslipidemia was present as risk factor among 24 cases and among controls dyslipidemia was present as risk factor among 9 participants. Smoking was present as risk factor among 11 cases and among controls smoking was present as risk factor among 8 participants. Mean fasting blood glucose (mmol/L) was 9.90±1.89 mmol/L among cases and among controls mean fasting blood glucose (mmol/L) was 8.43±3.28 mmol/L. Mean blood glucose after 2 hours (mmol/L) was 15.11±2.52 among cases and among controls mean blood glucose after 2 hours (mmol/L) was 12.61±4.72 mmol/L. Mean HbA1c (%) was 8.18±1.11 among cases and among controls mean HbA1c (%) was 6.95±1.44. (Table 2)

Table 2: Risk factors wise distribution of study subjects

Study parameters	Cases (n=30)	Controls (n=30)
Hypertension	22 patients	10 patients
Dyslipidemia	24 patients	9 patients
Smoker	11 patients	8 patients
Mean FBG (mmol/L)	9.90±1.89	8.43±3.28
Mean 2-h value (mmol/L)	15.11±2.52	12.61±4.72
Mean HbA1c (%)	8.18±1.11	6.95±1.44

Discussion

In present study, we enrolled 60 study participants, out of them 30 were cases and 30 were controls. Patients with urine albumin-to creatinine ratio 30 mg/g in at least two of three (if done) samples were enrolled as cases and those with urine albumin-to creatinine ratio <30 mg/g were enrolled as controls. Study participants were enrolled from outdoor and from ward by simple random sampling. The age of study participants was ranged from 34 years to 76 years. The mean age of cases was 48.4 ± 2.9 years and mean age of controls was 44.4 ± 2.1 years. Out of total study participants it was reported that males 54% were likely affected more than females 46% in cases while among controls 48% were males and 52% were

females. The mean BMI of cases was 26.6 ± 3.47 and mean BMI of controls was 24.6 ± 2.41 . Family history of diabetes mellitus was present in all 30 cases whereas it was present in 20 controls. Family history of diabetic nephropathy was found in 16 patients and 4 controls. Similar result was found in a study conducted by Rahim M et al among 100 patients of diabetic nephropathy. They reported Mean age was 46.6 years and there was female predominance. 25% patients were smokers, 50% were hypertensive and 40% had dyslipidemia. 60% of the study participants had positive family history of diabetes and 40% had family history of diabetic nephropathy. Mean body mass index (BMI) was 26.26 ± 2.97 kg/m² (8).

In the present study out of the total study participants, hypertension was present as risk factor among 22 cases and among controls hypertension was present as risk factor among 22 participants. Dyslipidemia was present as risk factor among 24 cases and among controls dyslipidemia was present as risk factor among 9 participants. Smoking was present as risk factor among 11 cases and among controls smoking was present as risk factor among 8 participants. Mean fasting blood glucose (mmol/L) was 9.90 ± 1.89 mmol/L among cases and among controls mean fasting blood glucose (mmol/L) was 8.43 ± 3.28 mmol/L. Mean blood glucose after 2 hours (mmol/L) was 15.11 ± 2.52 among cases and among controls mean blood glucose after 2 hours (mmol/L) was 12.61 ± 4.72 mmol/L. Mean HbA1c (%) was 8.18 ± 1.11 among cases and among controls mean HbA1c (%) was 6.95 ± 1.44 . Similar result was found in a study conducted by Deepa DV et al among 100 patients of diabetic nephropathy. They reported Mean age was 54.05 ± 13.24 years with male to female ratio of 1.6:1. The prevalence of diabetic nephropathy, neuropathy was 37% (9).

Similar result to present study was obtained in a study conducted by Iraj H et al among 200 patients of diabetic mellitus. They reported Mean age was 48.05 ± 8.24 years with male to female ratio of 1.8:1. The prevalence of diabetic nephropathy, neuropathy was 52% (10). Similar result to present study was obtained in a study conducted by Aravind S et al among patients of diabetic mellitus. They reported of the total 4,600 (males 67%, females 33%) patients with T2D, majority were from the age group 41-50 years (40%). 13.15% of newly detected India T2D had 1.06% had nephropathy. Risk factors of macro vascular complication such as hypertension, obesity, and dyslipidemia were observed in 23.3%, 26%, and 27% of patients respectively (3).

Conclusion

We concluded from the present study that hypertension was present as risk factor among 22 cases and among 22 controls. Dyslipidemia was present as risk factor among 24 cases and among 9 controls. Smoking was present as risk factor among 11 cases and among 8 controls. However, for the generalization of present study results large multicentric studies required with larger sample size.

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