PREVALANCE OF CHRONIC KIDNEY DISEASE STAGES 3-5 AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS: EXPERIENCE FROM A TERTIARY CARE HOSPITAL OF BANGLADESH

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Introduction and aims

Prevalence of diabetes mellitus (DM) is increasing and mostly contributed by type 2 diabetes mellitus (T2DM). DM is the most common cause of chronic kidney disease (CKD) and end-stage renal disease in developed as well as in developing countries [1-6]. This study was designed to evaluate the frequency of CKD stages 3-5 among selected group of T2DM subjects and to evaluate its relation with selected socio-demographic, clinical and laboratory parameters.

Methods

This cross-sectional study was done in Department of Nephrology, Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) General Hospital, Dhaka, Bangladesh from July to December 2015. Adult male and non-pregnant female T2DM subjects were consecutively and purposively included in this study. Patients with acute kidney injury (AKI), AKI on CKD, non-diabetic kidney disease and on renal replacement therapy were excluded. Enrolled patients were evaluated clinically and by laboratory tests. Diagnosis of CKD and CKD stages were determined according to Kidney Disease: Improving Global Outcomes (KDIGO) Clinical Practice Guidelines (2012), using estimated glomerular filtration rate (eGFR) [7] which were calculated by Modification of Diet in Renal Disease (MDRD), Cockcroft-Gault (C-G) and Chronic Kidney Disease Epidemiology (CKD-EPI) creatinine based formula.

Results

Total patients were 400 including 231 females. Base-line characteristics of the study participants are shown in Table I.

Table I. Base-line characteristics of the study subjects (N=400)

Characteristics	Value
Mean age (years)	55.2±11.2
Mean duration of diabetes (years)	11.6±7.6
Male: Female	1:1.4
Rural: Urban	1:3.1
Hypertension (%)	82
Dyslipidaemia (%)	37.5
Mean BMI (Kg/m^2)	24.6±4.5
Mean HbA1c (%)	9.1±2.0

[*BMI= body mass index; HbA1c=glycated haemoglobin*]

Out of 400 cases, 254 (63.5%), 259 (64.75%) and 218 (54.5%) cases had CKD stages 3-5 according to MDRD, C-G and CKD-EPI GFR estimating equations respectively (Table II). There was high burden of other classic complications of diabetes among the study subjects (Table III).

Table II. Frequency of different stages of CKD according to different equations among the study subjects (N=400)

CKD stages	MDRD n (%)	C-G n (%)	CKD-EPI n (%)
Stage 3a (GFR 45-59)	111 (27.75)	87 (21.75)	101 (25.25)
Stage 3b (GFR 30-44)	77 (19.25)	106 (24.50)	54 (13.5)
Stage 4 (GFR 15-29)	45 (11.25)	51 (12.75)	42 (10.5)
Stage 5 (GFR <15)	21 (5.25)	15 (3.75)	21 (5.25)

GFR was measured in ml/min/1.73 m^2

[*GFR=glomerular filtration rate; MDRD= Modification of Diet in Renal Disease; C-G=Cockcroft-Gault; CKD-EPI=Chronic Kidney Disease Epidemiology*]

Table III. Microvascular and macrovascular complications among the study subjects (N=400)

Complications	Frequency (%)
Microvascular	
Nephropathy/CKD* stages 3-5	218 (54.5)
Neuropathy	119 (29.8)
Retinopathy	151 (37.8)
Macrovascular	
Coronary artery disease	103 (25.8)
Peripheral vascular disease	56 (14)
Stroke/Transient ischaemic attack	44 (11)

[**CKD stages 3-5 as per CKD-EPI creatinine based formula*]

CKD was more among female patients, with long duration of diabetes and hypertension (Table IV).

Table IV. Presence of CKD stages 3-5 in relation to different risk factors (N=400)

Risk factors		Total number	CKD stages 3-5 n (%)	*p* value
Sex	Male	169	71 (42.0)	0.001
	Female	231	147 (63.6)	
Family history of DM	Present	204	110 (53.9)	0.810
	Absent	196	108 (51.1)	
Duration of DM	≥ 5 years	329	196 (59.6)	0.001
	< 5 years	71	22 (30.0)	
Hypertension	Present	325	186 (57.2)	0.022
	Absent	75	32 (42.7)	
Dyslipidaemia	Present	151	84 (55.6)	0.726
	Absent	249	134 (53.8)	
BMI (Kg/m^2)	≥ 25	161	94 (58.4)	0.200
	<25	239	124 (51.9)	
HbA1c (%)	≥ 7	355	185 (52.1)	0.007
	< 7	45	33 (73.3)	

Conclusions

More than half of the T2DM subjects had CKD stages 3-5 in this study. CKD was more in female T2DM subjects with long duration of diabetes and hypertension. Issues like glycaemic control and control of hypertension and weight management should be emphasized for a better renal and patient outcome.

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