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Study of risk factors in progression of chronic kidney disease (CKD)

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Abstract

Chronic kidney disease is a growing epidemic, with at least 10 million people with kidney damage. Diabetic kidney disease is the most common cause of ESRD worldwide. The rate of decline of GFR is variable, especially in diabetics, ranging from 2 to 20 ml/min/1.73 m2/yr. The reasons for these differences in the rate of disease progression are multifactorial, including both non-modifiable and modifiable factors. Aim is to retard progression of disease as cost of therapy is high. The study was planned to identify progression factors.

Keywords: Chronic kidney disease; risk factors; blood pressure; proteinuria; anemia

INTRODUCTION

The state of kidney damage or reduced kidney function lasting three months or longer, known as chronic kidney disease (CKD), is both progressive and irreversible.[1] In USA, 16 percent of general population is estimated to have CKD with the rate projected to increase. [2] The worldwide impact of CKD is significant, yet underestimated. According to the World Health Report 2002 and the global burden of disease project, kidney and urinary tract diseases contribute to 850,000 deaths per year and 15,010,167 in disability-adjusted life years.[3] The consequences of CKD in children are devastating, condemning patients to varying levels of chronic, lifelong medical disability.[4, 5] To study the rate of progression of CKD. To study risk factors involved in progression of CKD This study has been taken up.

MATERIALS AND METHODS

Patients having either gender, above age 18 yrs with GFR <60ml/min/1.73m^2 on 2 separate occasions, at least 3mths apart, were enrolled in the study. Total duration of enrollment was 3 months. Each patient underwent 3 monthly assessment of GFR. GFR was calculated by *MDRD Equation.* Patients were divided into slow progressers (rate of GFR decline<4ml/min/1.73m^2/yr and fast progressers (rate of GFR decline ≥4ml/min/1.73m^2/yr) '*NKF-K DOQI Guidelines 2002'* . Each patient was followed up for a period of 18 month

Inclusion criteria

Patients of either gender, Patients of > 18 yrs, Patients having GFR less than 60ml/min/1.73m^2 on two separate occasion.

Exclusion criteria

Patients on dialysis, Age less than 18yrs
Risk assessment was done using the following parameters

Age	HTN	Anemia
Sex	DM	Smoking
Etiology of CKD	Hyperlipidemia	Nephrotoxic drugs
	IHD	

At the end of 18 months each patient's decline in GFR was calculated & risk factors assessed.
Study was done in the Department of Nephrology, Seth GS Medical College & KEM Hospital.

Statistical analysis was done using SPSS Statistical package 16.0. Risk factor evaluation was done for each variable using the Pearsons Chi square. A p value < 0.05 was taken as significant. Factors found significant on univariate analysis were then assessed in a multivariate/logistic regression analysis.

RESULTS

134 patients were followed for a period of 18 months. Out of 134 patients 73 were males,61 were females. Mean age of study population was 47.62(SD+ 14.5) years. Mean age in male was 49.35 years. Mean age in female was 44.98 yrs. Majority(30%) of males were in the 51-60yr age group & females(31.1%)were in 41-50 yr age group.

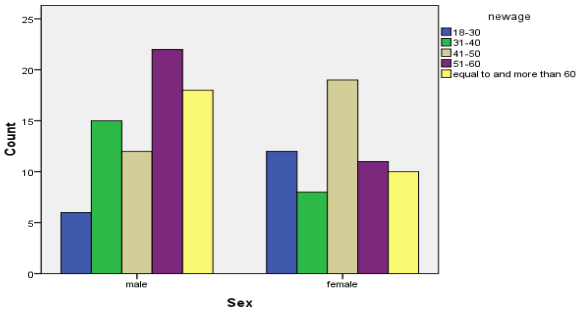

Fig 1. Age & sex distribution

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The most common cause of CKD was DKD followed by CGN and CTID . Patients having DM – 38.8%(type 1/type 2 – 7.69/92.3%. Patients having DM with DKD-34.3%(45). Patients having DM with nonDKD-4.5%(7). Patients having DM with DKD with HTN 24.6%(33 patients) .Patients having HTN- 67.9%. Proteinuria ≥ 1gm was present in 39.6% of patients**.** The mean proteinuria <1gm/d=0.540(SD 0.26) The mean proteinuria of ≥1gm/d=1.562(SD 0.54)

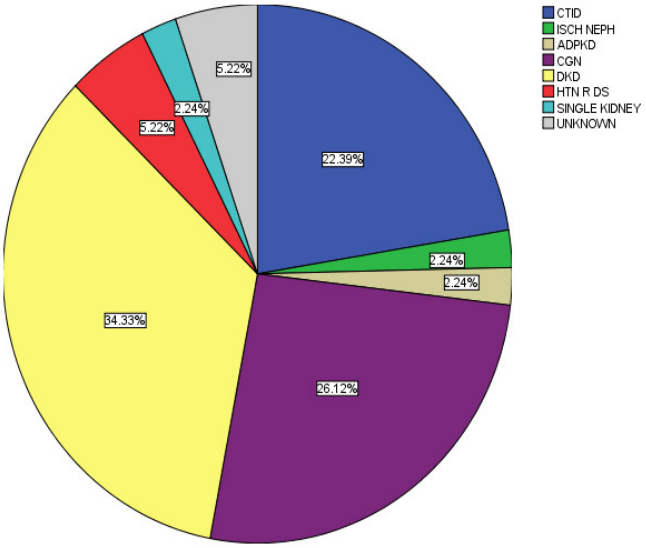
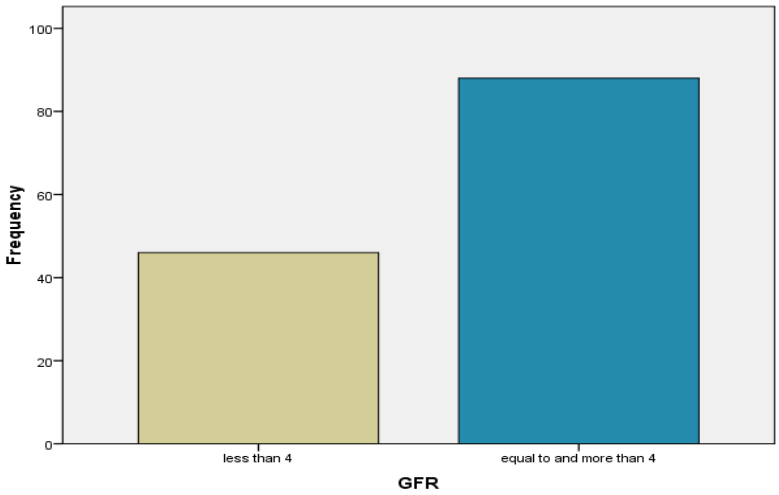


Fig 2**.** Original disease

Risk factor	%
Smoking	21.6
Hyperlipidemia	22.4
Anaemia	64.9

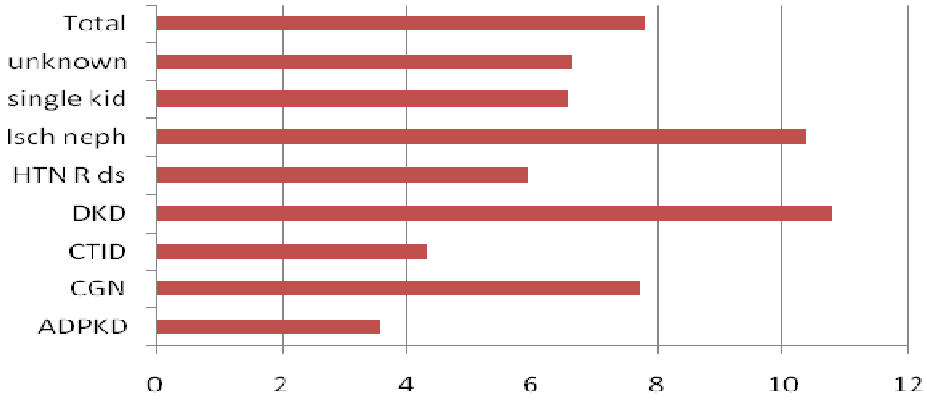
Average no of patients with GFR<4ml/min/1.73m2/yr were 34.3%(46)& ≥4ml/min/1.73m2/yr were 65.7%(88).



Sex & GFR Correlation

SEX	GFR (ml/min/1.73m2/yr)		P value
	<4	≥4	0.324
Male	30.2%(22)	69.8%(51)	
Female	39.4%(24)	60.6%(37)	
Total	34.3%(46)	65.7%(88)	

Original disease & GFR Correlation. Mean decline of GFR of the whole study population was 7.79 ml/min/yr(SD 6.74). Mean decline in GFR of each disease is depicted. DKD has maximum decline of 10.7 followed by ischemic nephropathy(10.3) & CGN (7.7). Rapid progression of disease (GFR > 4ml/min/yr)was seen in 88 (patients 65.7%)



Variable		GFR < 4	GFR ≥ 4		P value
Original dis					0.112
	ADPKD	2	1	3	
	CGN	11	24	34	
	CTID	19	11	30	
	DKD	8	38	46	
	HTN R dis	3	4	7	
	Ische Nep	0	3	3	
	Single kid	1	2	3	
	Unknown	2	5	7	
		46	88	134	

No significant correlation between GFR decline & original disease

		GFR<4	GFR ≥4		p value
	absent	25	18	43	.000
Hypertension	present	21	70	91	
	total	46	88	134	
	absent	37	45	82	.01
DM	present	9	43	52	
	total	88	88	134	

On univariate analysis diabetes mellitus & hypertension were found significantly correlated with progression of CKD.

		GFR < 4	GFR ≥ 4		P value
Duration of DM	< 5yrs	4	23	27	0.001
	≥ 5yrs	5	20	25	
Total		9	43	52	
Duration of HTN	< 5yrs	11	37	48	0.000
	5 – 10yrs	2	19	21	
	> 10yrs	7	11	18	
Total		20	67	87	
Proteinuria	<1gm	37	44	81	0.001
	≥1gm	9	44	53	
Total		46	88	134	
Anaemia	Males	14	42	56	0.001
	Females	11	24	35	
Total		25	66	91	

On univariate analysis factors also found strongly correlated with progression of CKD were smoking, proteinuria ≥ 1gm/d, anaemia Factors not significantly correlated were hyperlipidemia

		GFR < 4	GFR ≥ 4		p value
Smoking	Present	0	29	29	.000
	absent	46	59	105	
	total	46	88	134	
Hyperlipidemia	Present	9	21	34	0.574
	Absent	37	67	104	
		GFR<4	GFR≥4		P-value
IHD	Present	2	6	8	0.57
	Absent	44	82	126	
	Total	46	88	134	
NSAIDS	Present	0	7	7	0.15
	Absent	46	81	127	
	Total	46	88	134	
ALTERNATIVE DRUGS	Present	0	2	2	0.30
	Absent	46	86	132	
	Total	88	88	134	

CONCLUSION

Majority of patients had fast rate of progression of kidney failure irrespective of cause of kidney failure. Among the various causes, DKD was responsible for the most rapid decline of GFR. Diabetes, hypertension, smoking and presence of anemia were the most important factors independently associated with progressive kidney disease.

REFERENCES

[1] Eddy AA.2005. Progression in chronic kidney disease. Adv Chronic Kidney Dis ;12: 353–365.

[2] (USRDS) USRDS. USRDS 2008 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. , editor. Bethesda, MD

[3] Schieppati A, Remuzzi G. 2005. Chronic renal diseases as a public health problem: Epidemiology, social, and economic implications. Kidney Int 68:S7–S10.

[4] Staples AO, Smith JC, Gipson DS, Wong CS, Filler G, Warady B, Martz K, Greenbaum LA. 2007 Risk factors associated with progression of pediatric chronic kidney disease. 2007 E-PAS, 61:7919.5.

[5] Amy Staples, and Craig Wong, 2010. Risk Factors for Progression of Chronic Kidney Disease *Curr Opin Pediatr*. 22(2): 161–169.