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AN OBSERVATIONAL STUDY TO ANALYZE THE RISK FACTORS ASSOCIATED WITH CHRONIC KIDNEY DISEASE IN WESTERN RAJASTHAN, INDIA

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ABSTRACT **Background:** Chronic kidney disease (CKD) is a rising global health concern, with an increasing prevalence that threatens to overburden healthcare systems worldwide. According to the Global Burden of Disease (GBD) Study, CKD was responsible for over 1.2 million deaths globally in 2017, and projections suggest this figure will rise dramatically over the next few decades. By 2040, CKD is expected to become the 5th leading cause of death worldwide, reflecting its growing public health impact. **Aim And Objectives:** This study aims to analyze the main risk factors for chronic kidney disease and gauge knowledge among illness survivors. **Material And Methods:** 100 patients of both sexes, aged 18 to 60, who visited the OPD at the Nephrology Department at Mathura Das Mathur Hospital, Dr. Sampurnanand Medical College, Jodhpur, participated in this cross-sectional observational study. During the phases of analysis, data were gathered and suitable statistical tests were used. **Results:** In our study, 100 patients with chronic kidney disease were included. The incidence of CKD was predominant in males with 60% followed by females (40%). The CKD patients were divided into renal stages (mild, moderate, and severe) according to eGFR value. In the mild group, 23 patients were there, in the moderate group 29 patients and in the severe 48 patients were there, the result shows chi-square = 200 and p <0.0001. As people aged, so did the number of people with chronic kidney disease. The bulk of the 100 patients that were chosen are between the ages of 40 and 50. Hypertension was shown to be the most prevalent concomitant condition among patients with chronic renal disease (75%), followed by diabetes (27%), smoking (23%), and IHD patients (14%). 10% of CKD patients have a family history of cardiovascular illness, and 15% of CKD patients have a family history of CKD. **Conclusion:** This study concluded that the interplay of hypertension, diabetes, ischemic heart disease, family history, and smoking creates a complex web of risk factors that contribute to the increasing prevalence of chronic kidney disease in Western Rajasthan.

KEYWORDS :

INTRODUCTION

Chronic kidney disease (CKD) is defined as abnormal kidney function that lasts longer for more than 3 months and has health consequences. Many Epidemiological studies have demonstrated that end-stage renal disease (ESRD) and chronic kidney disease patients' morbidity and mortality are significantly influenced by damage to their big conduit arteries.[1]

Chronic kidney disease (CKD) is a growing global health challenge, with an increasing prevalence that threatens to overburden healthcare systems worldwide. According to the Global Burden of Disease (GBD) Study, CKD was responsible for over 1.2 million deaths globally in 2017, and projections suggest this figure will rise dramatically over the next few decades. By 2040, CKD is expected to become the 5th leading cause of death worldwide, reflecting its growing public health impact.[2]

Several observational studies conducted globally have highlighted common risk factors for CKD, including advanced age, male gender, diabetes, hypertension, obesity, and cardiovascular disease. However, studies specific to Western Rajasthan remain scarce, despite the region's unique environmental and lifestyle factors that may influence CKD prevalence.

Early identification of risks associated with chronic kidney disease coupled with the implementation of effective prevention programs will undoubtedly help to control the burden of this major epidemic. This observational study aims to identify and analyze the various risk factors associated with CKD in the population of Western Rajasthan, India.

MATERIAL AND METHOD

This cross-sectional, observational study included 100 consecutive patients of the 20-60 age group who attended OPD at the Nephrology department, Mathura Das Mathur Hospital, Dr. Sampurnanand Medical College, Jodhpur, Rajasthan in the year 2023-24.

Diagnosed CKD patients of both genders (male/female) attending OPD or admitted to the nephrology ward, aged 18 to 60 years, and those who are willing to give written consent for the study are included in this study. Patients with a renal transplant, Patients with systemic vasculitis or connective tissue disease, Peripheral artery disease, unstable Patients (hypotensive, encephalopathy, respiratory distress), and unable to perform the tests are excluded from the study.

The patients were divided into different renal stages according to the eGFR value NKF-KDOQI given using the Crockcroft-Gault equation.[3]

The Ethical Committee approval letter was obtained from the Institutional Ethical Committee for the study, and written consent was taken prior from each patient.

RESULT

The patients were divided into 3 stages Mild stage (G1, G2), Moderate stage (G3a, G3b), and Severe (G4, G5) stages as per the eGFR value, out of 100 patients, 23 were mild, 29 were moderate and 48 were severe patients. It shows a significant difference between these three stages (p=<0.0001).

Out of total CKD patients, the number of incidences of CKD in the 18-28 age group is 9%, no. of incidence in the 29-39 age group is 16%. No. of patients in the age group of 40-50 is 41% and the no. of patients in the 51-60 age group is 34%. According to the eGFR value, patients were divided into three groups of renal stages i.e. mild, moderate & severe. The significant difference was shown by the distribution of age between mild, moderate, and severe renal stages. (<0.05) (table 1)

Out of the total CKD patients, 60% were males and 40% were females. According to eGFR, CKD is divided into three groups: mild, moderate, and severe. Most of the patients studied, both men and women, belonged to the severe groups. (table 1)

Gender-wise distribution showed statistically no significant difference between renal stages (mild, moderate, and severe) (p>0.05). (table 1)

Among CKD patients, hypertension was the most prevalent co-morbid disease (75%), followed by diabetes (27%), and smoking (23%). 15% have a family history of chronic kidney disease. IHD affects 14% of individuals, and 16% of patients have a family history of the condition. (Table 2)

A highly significant negative correlation between eGFR and age is illustrated in Table 3.

Table 1- Distribution Of CKD Patients According To eGFR Renal

Stages In Different Age Groups, Gender & Co-morbid Conditions

		Renal Staging			Total	Chi-Square Value	P value
		Mild	Moderate	Severe			
Age group	18-28 Years	6	1	2	9	20.515	0.002 (S)
	29-39 Years	7	5	4	16		
	40-50 Years	7	14	20	41		
	51-60 Years	3	9	22	34		
Gender	Male	16	19	25	60	2.498	0.287(NS)
	Female	7	10	23	40		
HTN	Normotensive	5	7	13	25	0.253	0.881(NS)
	Hypertensive	18	22	35	75		
	Total	23	29	48	100		
DM	Normal	13	20	40	73	6.008	0.05(S)
	Diabetic	10	9	8	27		
	Total	23	29	48	100		
IHD	Normal	19	23	44	86	2.578	0.276(NS)
	Ischemic Heart Disease	4	6	4	14		
	Total	23	29	48	100		
F/H OF IHD	Normal	21	21	42	84	4.247	0.12(NS)
	F/H of IHD	2	8	6	16		
	Total	23	29	48	100		
F/H OF CKD	Normal	20	27	38	85	2.844	0.241(NS)
	F/H of CKD	3	2	10	15		
	Total	23	29	48	100		

HTN- Hypertension, DM- Diabetes Mellitus, IHD- Ischemic Heart disease, F/H- Family history, CKD- Chronic Kidney Disease, S- Significant ($p<0.05$). NS- not significant ($p>0.05$)

Table 2 Co-morbid Condition In CKD Patients

Co-morbid condition	No. of patients	%
Hypertension	75	75
Diabetes	27	27
IHD	14	14
F/H of CKD	15	15
F/H of IHD	16	16
Smoking	23	23

Table 3 Correlation Between eGFR AND Age (Pearson's Correlation)

Variables (N 100)	r value	p-value	Significance
Age	-0.513	0.000	HS

NS = Not Significant, S = Significant ($p < 0.05$) HS = Highly Significant ($p <0.01$)

DISCUSSION

One of the biggest risk factors for CKD is hypertension. According to studies, high blood pressure can damage kidney blood vessels, which over time might result in a reduction in renal function (Levey et al., 2017) [4]. In Western Rajasthan, the prevalence of hypertension is concerning, exacerbated by lifestyle factors such as diet, physical inactivity, and limited access to healthcare. Effective management of hypertension through lifestyle modifications and medication is critical to preventing CKD.

Diabetes mellitus is recognized as a leading cause of CKD globally, with studies showing a strong correlation between uncontrolled diabetes and renal impairment (Wang et al., 2018)[5]. The rise in diabetes prevalence in India, particularly in urban areas of Rajasthan, emphasizes the need for early detection and management strategies. Screening programs for at-risk populations, particularly those with obesity or sedentary lifestyles, could play a crucial role in mitigating this risk.

Ischemic heart disease is linked with increased cardiovascular risk, which often correlates with kidney disease. Patients with IHD may have shared risk factors such as hypertension and diabetes, compounding the risk for CKD (Saran et al., 2019) [6]. The connection between heart and kidney health underscores the importance of integrated care approaches that address both cardiovascular and renal health simultaneously.

A family history of CKD is a strong predictor of the disease, suggesting a genetic predisposition or shared environmental factors that increase susceptibility (Levey et al., 2017)[4]. In populations where familial patterns of chronic diseases are prevalent, such as in Rajasthan, awareness programs should include education about the risks associated with family histories of CKD and proactive monitoring of renal health for at-risk individuals.

Similar to CKD, a family history of ischemic heart disease indicates an increased risk for cardiovascular diseases, including CKD. Genetic factors and lifestyle habits passed down through generations can contribute to this increased risk. Individuals with a family history of IHD should be closely monitored for both heart and kidney health, encouraging preventive measures like regular health screenings and lifestyle changes.

For many chronic illnesses, including CKD, smoking is a known risk factor. It can cause vascular damage and raise blood pressure, which can affect renal function (Rao et al., 2015) [8]. Smoking cessation programs should be a part of public health initiatives to reduce CKD prevalence in Western Rajasthan. Educating the community about the renal risks of smoking, especially among younger populations, could significantly impact future CKD rates.

CONCLUSION

The interplay of hypertension, diabetes, ischemic heart disease, family history, and smoking creates a complex web of risk factors that contribute to the increasing prevalence of chronic kidney disease in Western Rajasthan. Understanding these relationships allows for the development of comprehensive prevention and management strategies. Public health policies should prioritize awareness and screening for these risk factors, particularly in high-risk populations. Additionally, integrating care for cardiovascular and renal health could improve outcomes for individuals affected by these interconnected conditions.

REFERENCES

1. Muntner, P., He, J., & Vupputuri, S. (2002). Prevalence of chronic kidney disease in the United States: Results from the Third National Health and Nutrition Examination Survey. *American Journal of Kidney Diseases, 39*(1), 1-12. https://doi.org/10.1053/ajkd.2002.30252
2. GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. (2018). Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. *Lancet, 392*(10159), 1789-1858. https://doi.org/10.1016/S0140-6736(18)32203-7
3. National Kidney Foundation. (n.d.). *eGFR calculator*. Retrieved December 3, 2024, from https://www.kidney.org/professionals/kdoqi/gfr_calculatorCoc
4. Levey, A. S., de Jong, P. E., Coresh, J., El Nahas, M., & Pavkov, M. E. (2017). Chronic kidney disease. *Lancet, 389*(10075), 1234-1246. https://doi.org/10.1016/S0140-6736(16)32413-5
5. Wang, H., Zhang, X., Li, Y., & et al. (2018). Diabetes mellitus and chronic kidney disease: A review of the mechanisms and clinical implications. *Frontiers in Medicine, 5*, 286. https://doi.org/10.3389/fmed.2018.00286
6. Saran, R., Robinson, B. M., Abbott, K. C., et al. (2019). US Renal Data System 2018 annual data report: Epidemiology of kidney disease in the United States. *American Journal of Kidney Diseases, 73*(3), A7-A8. https://doi.org/10.1053/j.ajkd.2018.12.032
7. Wang, T. J., & Vasan, R. S. (2018). Family history of cardiovascular disease and risk of coronary heart disease. *Circulation, 137*(6), 570-579. https://doi.org/10.1161/CIRCULATIONAHA.117.029004
8. Rao, P. S., Moorthy, A. V., & Levey, A. S. (2015). The role of smoking in chronic kidney disease: A review. *Nephrology Dialysis Transplantation, 30*(6), 856-861. https://doi.org/10.1093/ndt/gfu462.