

Retrospective Evaluation of a Large Nephrology Out-Patient Cohort

Abstract:

Background: chronic kidney disease remains a concern for both patients and health care providers due to its associated cost and complications. This study evaluates a large database of patients presenting to a nephrology out-patient clinic.

Methods : retrospective review of about 4000 patients presenting to the outpatient nephrology clinic at a tertiary care hospital.

Results: There were 4054 patients enrolled in the clinic, after cleaning of data for missing data or wrong entries 3217 subjects remained for evaluation. 1486 (46.19%) were diabetics and 1199 (37.27%) were hypertensive. Total of 1277 (%) patients had ESKD and 501 (%) were diabetics

Conclusion: CKD is a growing burden of disease in Pakistan and our study highlights the underlying diabetes and hypertension as the leading causes of CKD.

Key words: Diabetes mellitus, chronic kidney disease, end stage kidney disease, anemia, kidney stone disease.

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Introduction:

Diagnosing with chronic kidney disease (CKD) is a cause of concern for the patients as well as for healthcare administrators due to associated huge costs. About 700,000 patients are currently receiving hemodialysis and peritoneal dialysis in USA and Taiwan has the highest ESKD prevalence at 3,392 per million population (pmp).^{1,2}

This is a huge burden on the health care system that requires recurring cost of twice or thrice a week therapy lifelong. It is therefore that ESKD is covered by the government funding in majority of countries including Pakistan. Availability of funds in the richer countries still required a deeper look into the prevalence of CKD and processes to decrease the CKD incidence and progression to ESKD.³

It is important to note that preventive aspect of nephrology is often neglected and due attention to the preventive aspects of diseases can help in reducing health care cost by mitigating the incidence and progression of CKD. Recent interventions in detection and preventive aspects of chronic diseases such as hypertension and diabetes mellitus has led to stable or decreasing trend of CKD incidence globally.^{4,5}

There is lack of large data set from Pakistan examining the underlying etiologies of CKD. This study therefore is an effort to explore the underlying causes of CKD in a large cohort of patients being followed up in a nephrology clinic.

Methods:

This study was approved by the ethical review board dated: 01/03/2025 vide reference # IRBEC/BIH/079-2025. this is cross-sectional retrospective data analysis of more than 4054 patients enrolled in the nephrology clinic from 2018 till 28 February, 2025.

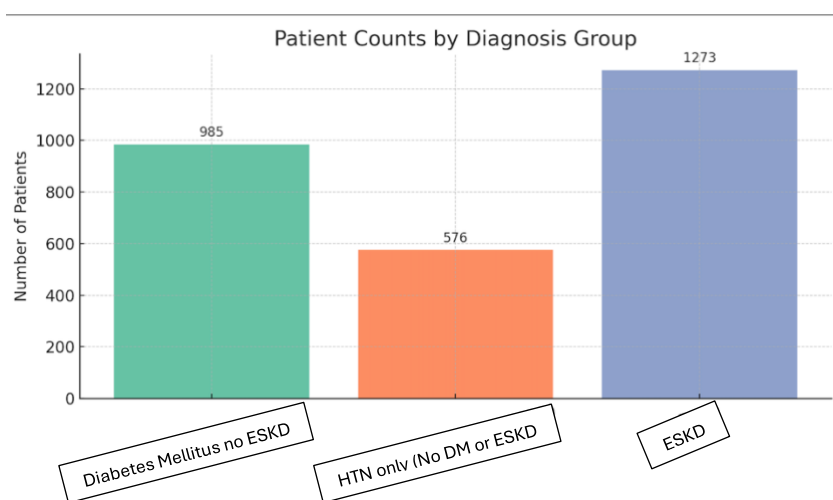
Data was stored with age, gender and individual diagnoses. Total of 4054 patients were enrolled in the database. Patients younger than 18 years, missing data or with wrong entries were excluded leaving 3217 patients for statistical analysis.

SPSS (version 22, IBM, Armonk, NY,USA) was used to observe the frequency of data. Data is presented in mean with standard deviation, percentage of frequencies and ODDS ratio to assess the influence of factors on underlying diagnoses.

Results:

Out of 4054 patients 3217 patients were available for evaluation. Male 2199 (65.87%), mean age 48.17 ± 16.45 years, male 47.26 ± 16.5 years and females 49.94 ± 16.23 years. Almost half of the patients were diabetics 1486 (46.19%) and hypertension alone in 1199 (37.27%). 1273 (32.7%) patients had ESKD and were on maintenance dialysis. Among ESKD patients 501 (39.36 %) were diabetics and 623 (48.94%) had a diagnosis of hypertension as a possible cause of ESKD. More than half of patients 1923 (59.78%) had anemia. With an ODDS ratio for presence of anemia was 9.92 (8.2-11.99, $p < 0.001$) for ESKD patients, 0.38 (0.32- 0.44, $p < 0.001$) for diabetics without ESKD and 0.35 (0.29- 0.42, $p < 0.001$) for hypertension without ESKD.

Figure 1: Main diagnoses among 3217 patients enrolled in a nephrology clinic.



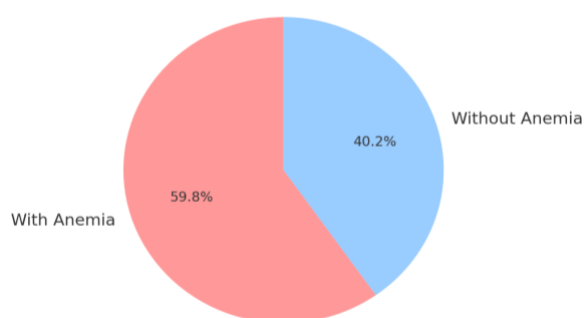
Discussion:

This large study of 3217 patients supplements the high prevalence of diabetes mellitus and hypertension as the cause of CKD among patients presenting to the outpatient clinics.⁶

Etiology & CKD

Several studies from different regions of Pakistan have evaluated the underlying causes of CKD, highlighting locoregional differences based on weather conditions and cultural habits and urbanization.⁷

Figure 2: Pie chart showing percentage of patients having anemia among 3127 patients in a nephrology clinic. The table highlights the odds ratio of having anemia with underlying diagnosis and presence of end stage kidney disease.



#	Group	Odds Ratio	95% CI	p-value
1	ESRD	9.92	8.21–11.99	0.0
2	DM-related (no ESRD)	0.38	0.32–0.44	0.0
3	HTN only (no DM/ESRD)	0.35	0.29–0.42	0.0

In all these studies diabetes mellitus remains a major cause of CKD similar to global trends. It is therefore the policy makers, medical and nephrology societies to have a collaborative effort in educating the masses about the importance of prevention and management of chronic diseases such as diabetes mellitus and hypertension. The decrease in trend of CKD was possible in certain countries through these concerted efforts.

Globally, the prevalence of CKD increased by 33% between 1990 and 2017, with the most significant growth observed in low to middle-income countries.⁸ This trend underscores the rising burden of CKD in regions like Pakistan.^{9,10}

Anemia resulting from CKD progression leads to significant morbidity and mortality and having diabetes or hypertension was a risk factor for anemia in our study.¹¹

In Pakistan about 12.5-31.2% population may have some sort of stage of CKD.⁸ This percentage of population along with easy accessibility to any medicine over the counter and lack of health education is probably adding to the rapid increase in ESKD population in Pakistan. Regional differences in weather and habit within Pakistan also highlight the variable etiology. Kidney stone disease is more prevalent in the hot and dry climate and remains undiagnosed or poorly managed leading to a significant percentage ending up as ESKD.⁸ Kidney stone disease if managed properly can lead to

an excellent recovery and prevention of CKD. Focused approach in dealing with local regional etiologies requires leadership role of nephrology community especially Pakistan Society of Nephrology to highlight such issues at all levels. This, as mentioned earlier is a huge financial burden for the government. There also need to have combined efforts in this regards to improve the health education through multiple channels including social media.¹²

Conclusion:

CKD is a growing burden of disease in Pakistan and our study similar to other studies highlights the underlying diabetes and hypertension as the number one cause.

Conflict of Interest: None declared

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