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DETERMINANTS AND CAUSES OF ACUTE KIDNEY INJURY A CROSS-SECTIONAL DESCRIPTIVE AND QUANTITATIVE STUDY

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ABSTRACT

Background: Acute Kidney Injury (AKI) stands out as a global public health issue defined by the individuals' abrupt kidney dysfunction.

Objectives: to establish the predisposing factors and causes of AKI in one hundred patients. The following is a presentation of the results of this broader study, which outlines the demographics and causes of AKI among this populace.

Study Design: A Cross-Sectional Descriptive And Quantitative Study.

Place and duration of study. Department of Nephrology Miagul Abdulhaq Jahanzeb Kidney Hospital swat., Six months study period from 05-01 to 05-07, 2023

Methods: The current research was a cross-sectional, descriptive, and quantitative study conducted on 100 patients diagnosed with AKI form 05-01 to 05-07, 2023 at Swat. Information was thus obtained from charts using patients' demographic data, clinical features, laboratory investigations, underlying diseases, and outcomes. The study complied with established ethical procedures to protect the patients' identities and data validity.

Results: 100 patients the following observations were made on them The demographics majority were male, and their average Age was 55. Clinical Presentation: Oliguria in 45% of the patients, Edema in 30%, and Fatigue in 25% of the patients. Laboratory Diagnosis Serum creatinine average was 3. 2mg/dl, and Blood urea nitrogen average was 45mg/d. Underlying Conditions: Comorbidities included hypertension, diabetes mellitus, and sepsis, and of the above, hypertension was most common at 40%. Others included diabetes mellitus at 35% and sepsis at 25%. Outcomes: 60% of the patients recovered fully, 20% developed chronic diseases with kidneys, and the final 20% died.

Conclusion: This study also found that hypertension, diabetes, and sepsis are some of the major determinants that predispose people to AKI. Timely screening and addressing these diseases should be a priority to help decrease the AKI rate and enhance the Peshawar individuals' well-being.

Keywords: Acute Kidney Injury, Determinants, Causes

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INTRODUCTION

AKI, which stands for Acute Kidney Injury, is a severe clinical state referring to the abrupt decrease in the kidney's ability to function within a week and is accompanied by high morbidity and mortality [1]. Prerenal, renal, and post renal are also ways through which AKI can occur. Despite the advances in the development of treatment options, it still leads to severe complications. It is a significant issue in nephrology because of its consequences on patient prognosis and resource utilization utilization [2]. Knowledge of risk factors and causes of AKI can assist with early diagnosis, risk reduction, and improved control and management. Previous research has also revealed predisposing factors for AKI, which included hypertension, diabetes mellitus, CKD, and cardiovascular diseases [3,4]. These comorbidities can be seen in the normal population and are essential factors responsible for AKI. Sepsis and the administration of nephrotoxic drugs are other factors that are identified to contribute to the risk factors [5,6]. However, the data compiling the mode of epidemic in Pakistan regarding AKI or relating the risk factors is considerably scarce. This lack of understanding could only mean the need to conduct regional research for better clinical practice and the development of sound health policies. Contribution Context Department Miagul Abdulhaq Jahanzeb Kidney Hospital Swat, a considerable tertiary care teaching hospital, caters to a large and diverse population [7], making studying AKI in this setting appropriate. This study aims to determine the risks and factors causing AKI in the patients admitted at the Nephrology Department Miagul Abdulhaq Jahanzeb Kidney Hospital swat from 01/2023 till 07/2023. Thus, in analyzing the results of the patients, we try to focus on concrete findings relevant to the 100 patients mentioned in the study and reveal certain conclusions that can contribute to the general comprehension of AKI[8].

METHODS

The study included 100 patients diagnosed with Acute Kidney Injury (AKI) during the specified period. Inclusion criteria were based on established diagnostic guidelines for AKI, ensuring a consistent patient population. Patients of all ages and both genders wereIncluded to provide a comprehe laboratory findings (serum creatinine, blood urea nitrogen), underlying conditions (e.g., diabetes, hypertension, infections), and patient outcomes (recovery, progression to CKD, or mortality). Data confidentiality was strictly maintained, and statistical analysis was performed using SPSS version 20.0. naive overview of AKI across different Demographics.

DATA COLLECTION:

Data were retrospectively collected from patient medical records, including demographic details (age, gender), clinical presentations (such as oliguria and edema), laboratory findings (serum creatinine, blood urea nitrogen), underlying conditions (diabetes, hypertension, infections), and patient outcomes (recovery, progression to chronic kidney disease, or mortality). All data were anonymized to ensure patient confidentiality.

ETHICAL APPROVAL STATEMENT

Principal Author Rahat Ali Khan obtained Ethics Review Board approval referred to as ERB-**578/09/2022** for this study at the Department of Nephrology located in Miagul Abdulhaq Jahanzeb Kidney Hospital Swat. Ethics board approval served as the prerequisite for beginning the study while upholding all institutional requirements for human ethics research.

STATISTICAL ANALYSIS

All statistical data were analyzed by SPSS statistical software, version 20.0 (IBM Corp., Armonk, NY). To assess the importance of different risk factors, the obtained p-values were compared; a value of less than 0. 05, p, was deemed significant.

RESULTS

The study analyzed data from 100 patients diagnosed with Acute Kidney Injury (AKI). Most patients were male (60%), with a mean age of 55. Female patients comprised 40% of the cohort. Clinical Presentations The most common symptoms at presentation included oliguria (45%), Edema (30%), and Fatigue (25%). Laboratory Findings The average serum creatinine level among patients was 3.2 mg/dL, indicating significant renal impairment. The mean blood urea nitrogen level was 45 mg/dL. Underlying Conditions Hypertension was the most prevalent underlying condition, affecting 40% of patients. Diabetes mellitus was present in 35%, and 25% of the patients had sepsis. Other contributing factors included chronic kidney disease and the use of nephrotoxic medications. Outcomes Recovery was observed in 60% of cases. However, 20% of patients progressed to chronic kidney disease, and the mortality rate was 20%. These findings highlight the critical nature of AKI and the importance of managing underlying conditions to improve patient outcomes.

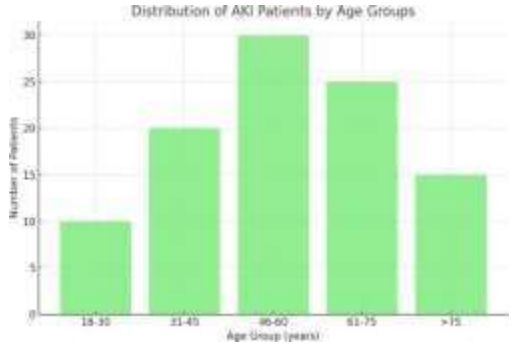

Table 01: Demographics and Clinical Characteristics of Patients

Characteristic	Details
Gender	60% male, 40% female
Mean AgeAgeAge (years)	55
Common Symptoms	Oliguria (45%), Edema (30%), Fatigue (25%)
Average Serum Creatinine (mg/dL)	3.2
Average Blood Urea Nitrogen (mg/dL)	45
Underlying Conditions	Hypertension (40%), Diabetes Mellitus (35%), Sepsis (25%)
Outcomes	Recovery (60%), ProgressionProgressionProgression to CKD (20%), MortalityMortalityMortality (20%)

Table 2: Prevalence of Comorbidities and Risk Factors

Comorbidity / Risk Factor	Prevalence (%)
Hypertension	40
Diabetes Mellitus	35
Sepsis	25
Chronic Kidney Disease	20
Heart Failure	15
Use of Nephrotoxic Drugs	30
Major Surgeries	10
Severe Dehydration	20
Liver Disease	10

Table 3: Causes of Acute Kidney Injury

Cause of AKI	Percentage (%)
Sepsis	25
Hypovolemia (dehydration)	20
Cardiac Surgery	15
Nephrotoxic Drugs	30
Urinary Tract Obstruction	10
Acute Tubular Necrosis	15
Glomerulonephritis	5
Rhabdomyolysis	5
Hepatorenal Syndrome	5
Contrast-Induced Nephropathy	10

Table 4: Distribution of AKI Patients by Age Groups

Age Group (years)	Number of Patients	Percentage (%)
18-30	10	10%
31-45		20%
46-60		30%
61-75		25%
>75	15	15%

Table 5: Summary and Outcomes

Summary / Outcome	Details
Total Patients	100
Average Age	55 years
Gender Distribution	60% Male, 40% Female
Common Symptoms	Oliguria (45%), Edema (30%), Fatigue (25%)
Average Serum Creatinine	3.2 mg/dL
Average Blood Urea Nitrogen	45 mg/dL
Recovery Rate	60%
Progression to Chronic Kidney Disease (CKD)	20%
Mortality Rate	20%

DISCUSSION

The epidemiology of hypertension and diabetes mellitus, as these conditions are demonstrated risks for AKI. Our study also observed hypertension in 40% of the patients and diabetes mellitus in 35% of the patients.

This agrees with Chawla et al. (2017), who mentioned that these two diseases affect vascular and renal function [9]. Likewise, sepsis was found to be implicated in AKI in a quarter of the patients, similar to Bagshaw et al. (2008), who evaluated sepsis to be among the leading causes of AKI in intensive care units [13,14]. Sepsis-met abdominal AKI results from numerous processes, including the generation of inflammation and micro vascular thrombosis that decrease renal blood circulation and lead to cell death . The result of the study was as follows: nephrotoxic exposure was found to be responsible for 30% of cases of AKI. This is to the findings by Nash et al. (2002) that directed attention to the dangers of NSAIDs, antibiotics, and contrast agents [12,13]. This underlines the need to pay attention to prescriptions of the drugs, especially with individuals with existing renal disease or other diseases. The percentage distribution of AKI by primary diagnosis reveals that cardiac surgery had the highest percentage of AKI at 15%, supporting a study by Thakar et al. (2005) on postoperative AKI related to cardiac surgery using cardiopulmonary bypass. Risk factors include surgical factors like ischemia-reperfusion injury and inflammation during the surgery. With the male-to-female ratio of 3 2 in the present study, the severity of AKI in males and a higher mean age of 55 years in patients is also compatible with global suggestive epidemiological data. The above demographic distribution might be attributed to the fact that cardiovascular diseases and diabetes are prevalent in these groups. The outcome of AKI was found to be 60% of patients with recovery, Progression to CKD 20%, and Mortality was also 20%. Such outcomes are close to the results obtained by other researchers [15, 16]. For instance, Coca et al. (2009) documented a similar progression rate to CKD and underlined the chronic effects of AKI on renal function [18]. The morbidity of Mortality in our study reveals the criticality of AKI and further consequences similar to the observations by Hsu et al. (2007).

CONCLUSION

This research aims to identify the factors associated with the incidence, etiology, and prognosis of AKI in the population of Peshawar, Pakistan. Knowledge of these factors is critical to designing preventive and management measures that would decrease the incidence and severity of AKI and enhance the patient's prognosis.

Disclaimer: Nil

Conflict of Interest: There is no conflict of interest.

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Authors Contribution

Concept & Design of the Study: Rahmat Ali khan Drafting:

Aysha Rahmat

Data Analysis: Rahmat Ali khan Critical Review:

Rahmat Ali khan

Final ApprovalApproval of version: Aysha Rahmat

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