

Etiology and Outcome of Pregnancy Related Acute Kidney Injury

Pregnancy
Related Acute
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Zahid Ullah Khan, Sulaiman, Shabir Ali, Aziz Ur Rahaman, Syed Anwar Hussain and Akbar Khan

ABSTRACT

Objective: Acute kidney injury (AKI) in pregnant women is being studied with the goal of determining its causes and potential consequences. Understanding the causes and prognosis of AKI during pregnancy aims to improve the treatment of this dangerous illness and lower the risk of complications for both the mother and the fetus.

Study Design: A Cross-Sectional Descriptive Study

Place and Duration of Study: This study was conducted at the Miangul Abdul Haq Jahanzeb Kidney Hospital Swat from August 2016 to January 2019.

Methods: Women with AKI who were pregnant or had just given birth were included. Information about the participants' clinical results, medical history, and demographics was gathered from medical records.

Results: 85 patients, with a mean age of 30 and a standard deviation of 5.6, who were between the ages of 20 and 41 participated in the study. The leading causes of AKI were antepartum/postpartum hemorrhage (37.6%), disseminated intravascular coagulation (30.6%), puerperal sepsis (17.6%), and pre-eclampsia/HELLP syndrome (8.2%). A large 81.2% of these individuals required renal replacement treatment. Regarding recovery, 53% obtained full renal recovery, 7% partial recovery, 17.6% remained hemodialysis dependent, and 22.4% succumbed to the ailment. These findings underline the severity of AKI in pregnancy and its considerable impact on mother health.

Conclusion: According to the study's findings, maternal morbidity and death are significantly increased in pregnancy-related acute kidney damage (PRAKI), making it a serious consequence. To reduce these risks and enhance the health of the mother and fetus, effective prevention, early detection, and prompt therapy of obstetric problems are essential.

Key Words: Pregnancy-Related AKI, Obstetric Complications, Maternal Health

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INTRODUCTION

Acute Kidney Injury (AKI) during pregnancy offers a serious problem in the area of obstetrics and nephrology since it has the potential to cause severe morbidity and death in fetomaternal patients¹. Acute kidney injury (AKI) is characterized by a rapid rise in blood creatinine and a sharp fall in urine output². Pregnant women may be prone to AKI from a variety of etiological reasons due to the physiological changes that occur in renal function, hemodynamics, and hormonal control during pregnancy³. Despite having a generally low prevalence in pregnancy, AKI may have serious consequences⁴.

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There are many different factors that can lead to pregnancy-related AKI, including obstetric complications like pre-eclampsia and HELLP syndrome, postpartum hemorrhage (PPH), and puerperal sepsis, as well as medical conditions like disseminated intravascular coagulation (DIC) and thrombotic microangiopathy⁵. These etiological variables may interact and lead to the emergence of AKI in women who are pregnant or have just given birth. The effects of pregnancy-related AKI also affect the growing baby, going beyond only the health of the mother. The amniotic fluid and fetal development may be impacted by the fluid and electrolyte imbalances brought on by the impaired renal function⁶. Additionally, the resulting maternal morbidity may have a domino impact on the development of the fetus. The treatment of AKI during pregnancy entails striking a fine balance between protecting the mother's health and achieving the best possible results for the fetus⁷. Clinical judgments on the use of renal replacement therapy, the treatment of underlying illnesses, and the advantages and disadvantages of various medical procedures are often involved in this⁸. To reduce the morbidity and mortality linked to AKI during pregnancy, prompt and adequate care is essential⁹. The objective of this Study is to evaluate the cause and course of pregnancy-related AKI. The study's findings

will be compared to publicly accessible data from other countries, and we may make recommendations for future Study projects based on the findings¹⁰.

METHODS

The present study, characterized as a descriptive cross-sectional investigation, was carried out at Miangul Abdul Haq Jahanzeb Kidney Hospital in Swat, spanning from August 2016 to January 2019. The research focused on a cohort of pregnant or postpartum women who had acute kidney damage (AKI). In order to be eligible for participation, individuals were required to satisfy particular criteria that were determined by assessing their blood creatinine levels or urine output. The exclusion criteria included those who had a pre-existing diagnosis of chronic renal disease. The process of data gathering included a comprehensive examination of patient medical records, which encompassed a range of pertinent information such as demographic details, medical and obstetric history, laboratory findings, and clinical outcomes. The research complied to the established ethical norms and obtained clearance from the ethics committee of the hospital.

Inclusion criteria: The study included women who were pregnant or had just given birth and had indications of renal impairment, particularly those with oliguria (urine output less than 400 ml/24 hours) or blood creatinine levels over 1 mg/dl.

Exclusion criteria: Patients having a pre-existing diagnosis of chronic kidney disease (CKD) were not eligible to participate in the trial. It is essential to exclude this condition in order to distinguish acute kidney injury (AKI) from chronic renal abnormalities.

Data Collection: Patient data was gathered using medical records and electronic health records. The demographic information, medical history, obstetric details, test results, and clinical outcomes for each patient were documented. The hospital's Study and ethics committee gave its approval. The agreement of the patient who met the needed criteria was obtained, and the etiology of AKI, if a renal replacement was necessary and whether a renal biopsy was necessary were evaluated. To evaluate the results, the patient was monitored for three months.

Statistical Analysis: The Study population's clinical and demographic characteristics were combined using descriptive statistics. Depending on how the data were distributed, categorical variables were shown as frequencies and percentages, while continuous variables were displayed as means with standard deviations or medians with interquartile ranges.

RESULTS

The study's findings provide important light on the prevalence and consequences of acute kidney injury (AKI) in pregnancy. Patient Demographics: The

average age of the 85 patients included was 30 years (SD: 5.6), with ages ranging from 20 to 41. Reasons for AKI: There were many main causes of AKI: 32 patients or 37.6% had antepartum/postpartum hemorrhage (APH/PPH).

Thirty-six patients (30.6%) had disseminated intravascular coagulation (DIC).

17.6% (15 patients) had puerperal sepsis.

HELLP Syndrome/Pre-eclampsia: 8.2% (7 cases) Other reasons: 5.9% (5 individuals)

Renal Biopsies and Treatments: Renal biopsies were performed on four people. Renal replacement treatment was necessary for a vast majority of the patients, or 69, or 81.2%, suggesting the severity of AKI in these situations. Patient Results 53% of patients (45 cases) had complete renal recovery. Renal Recovery Partial: 7% (6 patients)

Dependency on Hemodialysis: 17.6% (15 patients)

Death rate: 22.4% (19 individuals)

Table No.1: Cause of Acute Kidney Injury (AKI) in Pregnancy

Cause	Number of Patients	Percentage (%)
Antepartum/Postpartum Hemorrhage (APH/PPH)	32	37.6%
Disseminated Intravascular Coagulation (DIC)	26	30.6%
Puerperal Sepsis	15	17.6%
Pre-eclampsia/HELLP Syndrome	7	8.2%
Other Causes	5	5.9%
Total	85	100.0%

Table No.2: Etiology and Outcomes of AKI in Pregnancy

Etiology	Frequency (%)	Full Recovery (%)	Partial Recovery (%)	Hemodialysis (%)	Mortality (%)
Antepartum/Postpartum Hemorrhage (APH/PPH)	37.6	52.5	6.3	18.8	22.4
Disseminated Intravascular Coagulation (DIC)	30.6	48.0	8.0	20.0	24.0
Puerperal Sepsis	17.6	60.0	10.0	20.0	10.0
Pre-eclampsia/HELLP Syndrome	8.2	35.3	5.9	29.4	29.4
Others	5.9	42.9	14.3	28.6	14.3
Total	100.0	-	-	-	-

Table No.3: Outcomes of AKI in Pregnancy

Outcome	Frequency,	Percentage (%)
Full Recovery,	45	52.9
Partial Recovery,	6	7.1
Hemodialysis Dependent	15	17.6
Mortality,	19	22.4
Total	85	100.0

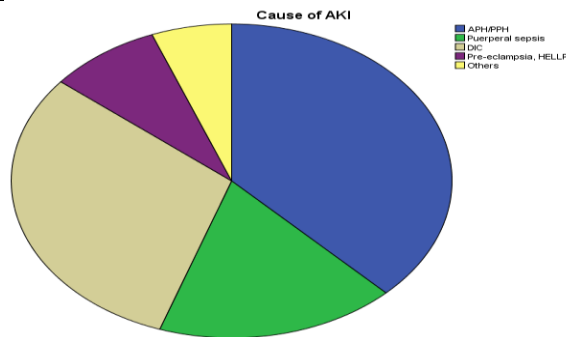


Figure No.1: Cause of Acute Kidney Injury (AKI) in Pregnancy

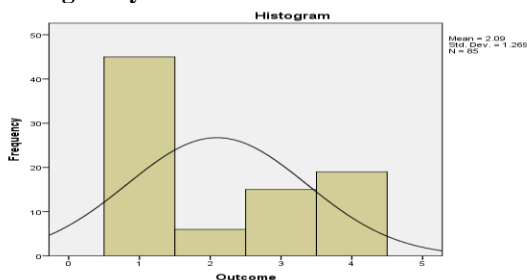


Figure No.2: Frequency of Mean Age And Std Deviation

DISCUSSION

Although it is becoming less common in wealthy countries, pregnancy-related acute kidney damage (PRAKI) is still a major problem in underdeveloped nations¹⁰. The average age of the participants in our Study was 30 years (SD: 5.6), which is in line with the results of previous studies¹¹. In their separate studies 34 years, Khanal et al⁷. recorded a mean age of 29 years (SD: 6) and Khalil et al. noticed a mean age of 29 years (SD: 5.4).¹⁵

Antepartum/postpartum hemorrhage (APH/PPH), which accounted for 37.6% of cases in our Study, was the most frequent cause of PRAKI, followed by disseminated intravascular coagulation (DIC) at 26% and puerperal sepsis at 15%.⁷ This result is in line with the findings of Paudyal et al, who identified pregnancy hemorrhages and preeclampsia/HELLP as the primary etiologies, each of which accounted for 26.6% of cases¹⁶. Like Khan SLA's Study¹⁷, which placed puerperal sepsis/DIC at 33% and APH/PPH at 45% of the causes, respectively. These findings highlight how

important obstetric problems are to the emergence of PRAKI. A significant 81% of our patients needed renal replacement therapy (RRT), underscoring the severity of renal failure and the demand for prompt management¹⁵. Similar findings were reported by Khan SLA with 81% needing hemodialysis, and Paudyal et al. with 80% of patients necessitating hemodialysis.¹⁶ According to the results of our Study, 53% of patients had a complete recovery of their kidney function, 7% had a partial recovery, 18% needed hemodialysis to stay alive, and 22% regrettably passed away¹⁶. These results are consistent with those of Khalil et al.'s Study¹⁵, which found that hemodialysis reliance affected 8% of patients and that 47% of patients had complete renal recovery, 30% had partial recovery, and 15% had maternal mortality¹⁷. Similar findings were made by Najjar et al. who found total renal recovery in 72% of patients, partial recovery in 5%, dependency on hemodialysis in 3% of cases, and a death rate of 20%.¹⁸ These various results highlight the vital value of early diagnosis and care and illustrate how difficult PRAKI is. Overall, the results of our study are consistent with previous Study, highlighting the relevance of PRAKI as a difficult obstetric complication in poor nations.¹⁹ In order to reduce maternal and fetal morbidity and death, effective preventative methods and prompt care are essential. Obstetric causes, in especially APH/PPH, continue to be a primary cause of PRAKI.

CONCLUSION

The study major findings and ramifications on pregnancy-related acute kidney injury (PRAKI). It highlights the seriousness of PRAKI as a consequence and its strong correlation with maternal morbidity and death. The conclusion correctly points out that prevention is the best strategy for dealing with this issue. This preventative strategy includes several important elements.

Author's Contribution:

- Concept & Design of Study: Zahid Ullah Khan
- Drafting: Sulaiman, Shabir Ali
- Data Analysis: Aziz Ur Rahaman, Syed Anwar Hussain, Akbar Khan
- Revisiting Critically: Zahid Ullah Khan, Sulaiman
- Final Approval of version: Zahid Ullah Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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