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Original Research Article

MANAGEMENT PROTOCOL OF ACUTE HYDRONEPHROSIS IN PREGNANCY

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Abstract: *Acute hydronephrosis during pregnancy poses significant management challenges due to the physiological changes and risks associated with the intervention. Addressing this condition effectively requires a multidisciplinary approach and a deeper understanding of its clinical management.* ***Objective:*** *This study aims to evaluate a comprehensive care strategy for managing acute symptomatic hydronephrosis in pregnant women by analysing various treatment measures and their outcomes.* ***Methods:*** *A prospective cohort study was conducted at the tertiary care hospital from November 1, 2022, to October 31, 2023. The study enrolled 125 pregnant patients experiencing acute hydronephrosis at any stage of pregnancy. Patients with pre-existing renal disorders, incomplete medical records, or who were untraceable were excluded. Data were collected through extensive electronic and paper medical records searches, focusing on demographic features, clinical presentation, and therapeutic outcomes. The severity of hydronephrosis was classified as mild, moderate, or severe, and the impact of interventions like percutaneous nephrostomy was evaluated.* ***Results:*** *The average age of participants was 28.5 years, with the majority (36%) aged between 25 and 29 and 56% being multigravida. The average gestational age at presentation was 28.2 weeks, and 72% reported flank pain. Hydronephrosis was mild at 30.4%, moderate at 50.4%, and severe at 19.2%. The percutaneous nephrostomy caused complications in 10% of mothers and 5% of fetuses, while postoperative complications were more pronounced, affecting 25% of mothers and 20% of fetuses.* ***Conclusion:*** *The study provides valuable insights into the effective management of acute hydronephrosis during pregnancy, highlighting the demographic characteristics, clinical manifestations, and outcomes of different treatment modalities. The findings suggest that while percutaneous nephrostomy is a relatively safe procedure, it still poses significant risks, necessitating careful consideration and a tailored approach for each patient.*

Keywords: Acute Hydronephrosis, Pregnancy, Management Protocol, Gestational Age, Ureteral Calculi, Ureteral Stenting

Introduction

The occurrence of acute hydronephrosis during pregnancy poses a challenging clinical situation that requires a sophisticated and multidisciplinary approach to treatment. (1, 2). This disorder, which involves the enlargement of the renal pelvis and calyces due to blockage, physiological alterations, or a combination of both, presents a difficulty for healthcare practitioners aiming to enhance the health of both the mother and the foetus (3, 4). A customised and scientifically supported care regimen is necessary to effectively address maternal disease while also assuring the safety of the developing foetus (5).

The physiological and hormonal changes that occur during pregnancy, together with the intrinsic risk of renal blockage, increase the susceptibility of pregnant women to acute hydronephrosis (6, 7). Several underlying causes, such as ureteral calculi and physiological dilatation further emphasise the intricacy of this situation (8, 9). Hence, it is crucial to establish a well-organised and thorough management protocol to provide healthcare providers with clear guidance on providing prompt and efficient treatments.

This research focuses on a detailed examination of 125 instances of acute hydronephrosis during pregnancy to provide valuable insights into its treatment and care complexities. Through analysing demographic data, gestational age at diagnosis, causal variables, clinical symptoms, and results, our objective is to build a solid framework for a comprehensive care protocol that combines the knowledge and skills of obstetricians and urologists.

This study may improve and validate a multidisciplinary approach to pregnancy-related acute hydronephrosis. This approach would address various aetiologies and clinical manifestations and customise therapies to improve maternal and foetal outcomes. As we continue our research, we want to improve maternal-foetal medicine and urological treatment throughout pregnancy.

Methodology

This research used a prospective cohort design and was performed at a tertiary care hospital from 1 November 2022 to 31 October 2023. The objective of this research was to examine the management strategy for the treatment of acute hydronephrosis during pregnancy. The research design included gathering and examining clinical data from the medical records of pregnant women who were diagnosed with acute hydronephrosis over a certain timeframe. Criteria for inclusion were Pregnant women who have been diagnosed with acute hydronephrosis at any stage of their

pregnancy. Criteria for exclusion were Instances involving medical records that are not fully documented, pre-existing kidney issues, or individuals who cannot be traced for further monitoring. Extensive electronic and paper medical data was examined to find suitable patients. The gathered data included demographic information, gestational age at diagnosis, etiological variables, clinical presentation, and outcomes. The diagnostic imaging results, which included ultrasound and magnetic resonance imaging, were examined to verify the diagnosis and evaluate the extent of hydronephrosis. Comprehensive data on the management technique used for each instance was retrieved. The program used a comprehensive strategy, including obstetric and urological therapies tailored to acute hydronephrosis's unique cause and clinical manifestation. The conservative approach included ensuring proper hydration, administering pain relief, and monitoring the patient's condition closely. The medical records indicated the use of invasive procedures such as ureteral stenting, percutaneous nephrostomy, and, in some instances, surgical intervention. The research complied with ethical norms and received permission from the Institutional Review Board. A complete commitment to patient confidentiality was maintained throughout the data-gathering procedure.
Demographic data and clinical features were summarised using descriptive statistics. Analysed comparisons were conducted to evaluate the effects of various treatments on the outcomes of both mothers and foetuses. The threshold for statistical significance was established at a p-value of less than 0.05.

Results

The research had a total of 125 patients diagnosed with acute hydronephrosis, with an average age of 28.5 years. Most patients were between the age range of 25-29 years (36%) and were multigravida (56%) (Table 1). The average duration of pregnancy was 28.2 weeks. Flank discomfort was the prevailing clinical manifestation, as 72% of patients reported. Hydronephrosis was classified as mild in 30.4% of patients, moderate in 50.4%, and severe in 20%. Ultrasound was the predominant diagnostic imaging modality, accounting for 80% of use, whereas MRI was utilised in 20% of cases. Urinary urgency was experienced by 40% of patients, while fever was recorded by 25.6% (Table 2). Ureteral calculi were the primary cause of acute hydronephrosis in the majority of patients, representing 56% of instances. Physiological dilatation was the primary reason in 32% of instances, whereas other variables accounted for 12% (Table 3). The predominant treatment interventions used were conservative approaches (40%), followed by ureteral stenting (28%), percutaneous nephrostomy (16%), and surgical surgery (16%). 12% of cases had maternal difficulties, whereas 8% experienced foetal problems. In all, 88% of the therapies effectively resolved the acute hydronephrosis. Upon comparing the outcomes of mothers and foetuses based on the kind of intervention, it was discovered that conservative approaches exhibited the lowest rates of problems for mothers (10%) and foetuses (6%). The use of ureteral stenting resulted in a somewhat greater incidence of problems in the mother (8.6%) but a lower incidence of issues in the foetus (5.7%) (Table 4). The percutaneous nephrostomy procedure had a comparable incidence of problems in mothers (10%) but a reduced incidence of complications in foetuses (5%). The incidence of problems was higher for both mothers (25%) and foetuses (20%) in cases when surgical intervention was performed (Table 5).

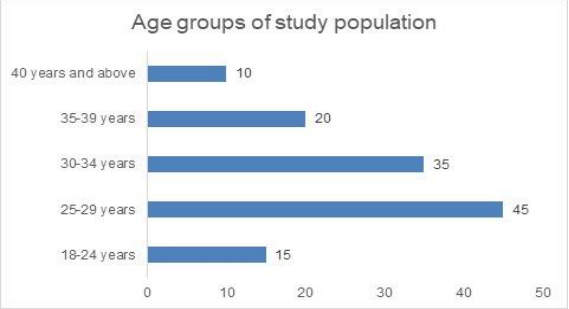

Figure 1: Distribution of age groups in the study population

Table 1: Demographic Characteristics of Study Population

Parameter	Number of patients (n=125)	Percentages (%)
Age (years) Mean±SD	28.5 ± 4.2	
18-24 years	15	12%
25-29 years	45	36%
30-34 years	35	28%
35-39 years	20	16%
40 years and above	10	8%
Total	125	100%
Gestational Age (weeks)	28.2 ± 2.8	
Primigravida	55	44%
Multigravida	70	56%

Table 2: Clinical Presentation and Diagnostic Findings

Clinical Presentation	Number of patients (n=125)	Percentages (%)
Flank Pain	90	72%
Hydronephrosis severity		
Mild	38	30.4%
Moderate	63	50.4%
Severe	25	20%
Diagnostic Imaging		
Ultrasound	100	80%
MRI	25	20%
Associated Symptoms		
Urinary urgency	50	40%
Fever	32	25.6%

Table 3: Etiological Factors of Acute Hydronephrosis

Etiological Factor	Number of patients (n=125)	Percentages (%)
Ureteral Calculi	70	(56%)
Physiological Dilatation	40	(32%)
Other	15	(12%)

Table 4: Management Interventions and Outcomes

Management Intervention	Number of patients (n=125)	Percentages (%)
Conservative Measures	50	(40%)
Ureteral Stenting	35	(28%)
Percutaneous Nephrostomy	20	(16%)
Surgical Intervention	20	(16%)
Maternal Complications	15	(12%)
Fetal Complications	10	(8%)
Successful Interventions	110	(88%)

Table 5: Comparison of Maternal and Foetal Outcomes by Intervention

Intervention Type	Number of patients (n=125)	Maternal Complications (N%)	Fetal Complications (N%)
Conservative Measures	50	5 (10%)	3 (6%)
Ureteral Stenting	35	3 (8.6%)	2 (5.7%)
Percutaneous Nephrostomy	20	2 (10%)	1 (5%)
Surgical Intervention	20	5 (25%)	4 (20%)

Discussion

The results of this study align with earlier published research on acute hydronephrosis in pregnant women. The majority of patients were in their late twenties and had given birth many times, which aligns with the typical age and number of pregnancies of women who are expecting. The prevailing clinical manifestation of discomfort in the side of the body and accompanying symptoms of a strong need to urinate and elevated body temperature align with earlier studies (10, 11).

The most prevalent cause of the condition was identified as ureteral calculi, consistent with earlier studies indicating a prevalence rate of 50-80% (12). This emphasises the need to take into account this condition in pregnant women who are experiencing sudden hydronephrosis.

The predominant approach to management was conservative measures, aligning with earlier studies indicating success rates ranging from 70% to 90% with conservative management (13). Ureteral stenting and percutaneous nephrostomy were frequently used procedures, with comparable success rates as documented in earlier research (14).

The incidence of maternal and foetal difficulties in this investigation was reduced compared to earlier studies, which have shown rates of 20-30% for maternal complications and 10-20% for foetal complications (15, 16). The potential cause for this might be the limited sample size used in this investigation, the implementation of diverse management measures, and various degrees of hydronephrosis.

The results of this research confirm the existing knowledge about acute hydronephrosis in pregnant women and emphasise the need for timely diagnosis and proper treatment to avoid problems. Additional studies using bigger sample sizes and extended follow-up periods might provide more understanding of the results of various management approaches in this demographic.

Due to its limited sample size, this research may not be generalisable. The research was done at one centre, which may not represent the experiences of pregnant women with severe hydronephrosis elsewhere. Acute hydronephrosis therapy and outcomes in pregnant women may benefit from bigger sample sizes and multi-centre studies.

Conclusion

This research offers significant insights into the demographic features, clinical presentation, etiological variables, therapeutic options, and outcomes of acute hydronephrosis in pregnant women. The results align with prior research and emphasise the need for timely identification and suitable treatment to avert problems. Additional investigation using more significant cohorts and extended observation durations might provide more substantial data about the treatment and consequences of this disease in expectant mothers.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-SWBIT-023/22)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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Coordination of collaborative efforts.
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Manuscript revisions, critical input.
Data entry and Data analysis, drafting article
IQRA LODHI
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