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A STUDY OF INTRADIALYTIC COMPLICATIONS IN PATIENTS UNDERGOING HEMODIALYSIS IN A TERTIARY HOSPITAL

Medical Science

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ABSTRACT

Background: Intradialytic complications are a major challenge in hemodialysis patients, impacting treatment efficacy and safety. This study evaluated the incidence, types, and predictors of intradialytic complications in a tertiary care setting. **Methods:** A prospective observational study was conducted from May 2023 to October 2024 in two teaching hospitals affiliated with J.J.M. Medical College, Davangere. A total of 109 adult patients undergoing hemodialysis were assessed for demographic variables, diagnosis, vascular access, biochemical parameters, and hemodynamic changes. Complications were analyzed using chi-square and Student's t-tests. **Results:** Complications occurred in 34.9% of patients, with hypotension (47.4%) most common, followed by chest pain (23.7%), rigors (15.8%), and muscle cramps (13.2%). AKI patients had higher complication rates than CKD patients (55.6% vs. 30.8%, p=0.025). Higher pre-dialysis urea and creatinine, as well as lower post-dialysis blood pressures, were significantly associated with complications. **Conclusion:** Intradialytic hypotension remains the predominant complication, particularly in AKI patients and those with higher uremic burden. Tailored dialysis prescriptions, vigilant hemodynamic monitoring, and optimization of ultrafiltration may reduce complication rates.

KEYWORDS

INTRODUCTION

Chronic Kidney Disease (CKD) is a progressive condition characterized by irreversible renal function decline. Globally, over 800 million people are affected, with high prevalence in low- and middle-income countries. Hemodialysis, while life-saving, is frequently complicated by intradialytic events, ranging from mild symptoms such as cramps to severe conditions like hypotension and arrhythmias. Intradialytic hypotension (IDH) occurs in up to 30% of sessions and can result in myocardial ischemia, cerebral hypoperfusion, and increased mortality. Risk factors include older age, diabetes, high ultrafiltration rates, electrolyte imbalances, and vascular access type. In India, limited resources and high dialysis burden necessitate studies that identify modifiable risk factors to improve patient safety and outcomes. This study aims to quantify the incidence and types of complications, and identify demographic, biochemical, and hemodynamic factors associated with these events.

MATERIALS AND METHODS

This prospective observational study was conducted between May 2023 and October 2024 at Bapuji Hospital and Chigateri General Hospital, Davangere. A total of 109 adult patients (>18 years) with CKD or AKI undergoing hemodialysis were included. Exclusion criteria were refusal to consent and age <18 years. Demographic details, diagnosis, vascular access type, biochemical parameters (blood urea, serum creatinine, sodium, potassium), and pre/post-dialysis blood pressures were recorded. Intradialytic complications were documented for each session.

Statistical analysis was performed using SPSS. Continuous variables were compared using Student's t-test, categorical variables using chi-square test, and $p<0.05$ was considered statistically significant.

RESULTS

Of the 109 patients, mean age was 51.7±11.8 years, with 50.5% males. CKD accounted for 83.5% of cases, and AKI for 16.5%. Permanent catheters were used in 80.7% of patients. Overall, 34.9% experienced intradialytic complications. Hypotension was most frequent (47.4%), followed by chest pain (23.7%), rigors (15.8%), and cramps (13.2%). AKI patients had higher complication rates than CKD patients (p=0.025). Complication group patients had significantly higher mean blood urea (180 vs. 165 mg/dL, p=0.024) and creatinine (10.0 vs. 9.2 mg/dL, p=0.036), and significantly lower post-dialysis systolic and diastolic BPs (p=0.001).

DISCUSSION

The complication rate of 34.9% observed in this study aligns with prior Indian and global reports. Intradialytic hypotension was the leading adverse event, particularly in AKI patients. Higher uremic burden and lower post-dialysis blood pressures were significant predictors, suggesting that aggressive ultrafiltration and inadequate hemodynamic compensation are key contributors. Previous studies have linked high ultrafiltration rates and potassium shifts to increased hypotension and arrhythmias. Our findings reinforce the need for individualized dialysis prescriptions, with adjustments in fluid removal, dialysate sodium concentration, and close monitoring of high-risk patients. Limitations include the single-center design and limited follow-up for long-term outcomes. Nevertheless, the study provides actionable insights for optimizing intradialytic safety in resource-limited settings.

CONCLUSION

Intradialytic hypotension is the most common complication in hemodialysis patients, especially among those with AKI and higher pre-dialysis uremic levels. Regular hemodynamic monitoring, individualized ultrafiltration targets, and tailored dialysate prescriptions can help reduce these events and improve patient outcomes.

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