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Research Article

SCORING SYSTEM OF HEMODIALYSIS IN RENAL FAILURE PATIENTS

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ABSTRACT

Renal failure, both acute and chronic, presents a significant healthcare challenge, demanding precise and personalized management strategies. Hemodialysis, a cornerstone of renal replacement therapy, plays a vital role in sustaining patients with compromised kidney function. In response to the evolving complexities of renal failure cases, the need for a standardized and objective scoring system to guide hemodialysis interventions has become increasingly evident. This study focuses on the development and implementation of a Scoring System of Hemodialysis tailored to assess the adequacy and efficacy of hemodialysis procedures in renal failure patients. Over the course of one year (June 2013 to July 2014), a cohort of 400 patients admitted to the medicine ward of Sri Lakshmi Narayana Institute of Medical Sciences was comprehensively evaluated. All patients were diagnosed with acute and chronic renal failure. The primary objectives of this research are to address the existing gaps in hemodialysis management, provide a systematic approach to optimize treatment strategies, and enhance overall patient outcomes. By analyzing the effectiveness of the proposed scoring system, this study aims to contribute valuable insights into refining hemodialysis protocols for renal failure patients. The outcomes of this investigation are expected to provide clinicians with a structured framework to assess, adjust, and tailor hemodialysis interventions based on individual patient needs and disease progression. Ultimately, the Scoring System of Hemodialysis seeks to fill a crucial void in the current clinical approach, offering a robust tool for clinicians to navigate the intricate landscape of renal failure management with precision and efficacy.

Keywords :- Renal failure. Hemodialysis, Scoring system, Renal replacement therapy.

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INTRODUCTION

Renal failure, characterized by the gradual or sudden decline in kidney function, poses a significant public health burden globally. According to the World Health Organization (WHO), an estimated 10% of the world's population is affected by CKD (Chronic kidney disease). The management of renal failure often involves renal replacement therapies, with hemodialysis standing as a cornerstone in providing life-sustaining support [1-3]. However, the optimal administration of hemodialysis remains a complex and multifaceted challenge, requiring a nuanced understanding of individual patient needs, disease progression, and treatment efficacy.

Over the years, the field of nephrology has witnessed advancements in hemodialysis technology, yet the lack of a standardized and objective assessment tool for evaluating the effectiveness of hemodialysis in renal failure patients has persisted. Recognizing the need for a comprehensive scoring system, researchers and clinicians have embarked on developing tailored frameworks that can guide therapeutic decisions and optimize patient outcomes [4-5].

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The background of this study is grounded in the evolving landscape of renal failure management, where the quest for precision and individualization of care has become increasingly paramount. The variability in patient responses to hemodialysis, coupled with the intricate interplay of factors influencing treatment efficacy, underscores the necessity for a systematic scoring system. Such a system could not only aid in gauging the adequacy of hemodialysis but also serve as a valuable tool for risk stratification, treatment adjustment, and long-term prognosis [6-7].

The absence of a widely accepted scoring system highlights a critical gap in the current clinical approach to hemodialysis in renal failure. Addressing this gap becomes imperative to refine therapeutic strategies, enhance patient outcomes, and pave the way for a more personalized and efficient management paradigm. In light of these considerations, our study aims to contribute to the development and application of a Scoring System of Hemodialysis, offering a tailored and evidence-based approach to guide clinicians in the intricate landscape of renal failure management.

MATERIALS & METHODS

Our study was conducted among 400 patients who were admitted in the medicine ward of Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry. All the patients were diagnosed with acute and chronic renal failure over a period of one year i.e; June 2013 to July 2014. Institutional ethical clearance got from institution and informed consent form obtained from patients.

With the help of Age, Gender, Acute Kidney Injury, Chronic Kidney Disease, Physical signs like Pulmonary edema, Acidotic breathing, output of urine, uremic encephalopathy signs and also Biochemical parameters like Blood urea, Serum Creatinine, Serum potassium and Serum bicarbonate, a scoring system has been developed which helps to assess the patient for dialysis immediately.

Inclusion criteria- All the patients with renal failure, Age >15 years are included in our study.

Exclusion criteria- patients with HIV, HBsAG positive cases, heart failure and any other liver diseases and also age < 15 years are excluded from our study.

Statistical analysis-

The data collected was recorded and analyzed by using SPSS version 20.0

Result

In our present study 400 patients are includes in which maximum number of cases were in the age group of 25-35 years, followed by 36-45years& 50-50 years. Very few cases were reported in the age group of 70-80years. Out of 400 cases, males are in majority i.e;220 and females are around 180 patients. Most common cause of renal failure is due to ESRD which requires RRT/HD whereas ARF is mainly due to post gastroenteritis renal failure. Most common sign observed in our study group is Oliguria (58%), followed by pulmonary edema (32%), Uremic encephalopathy (18%) and acidotic breathing (8%)

In our group of 400 patients, 212 patients requires dialysis whereas remaining 75 patients doesn't require dialysis and they need management with assessment of biochemical parameters every alternate day. 113 cases should be under close monitoring for every 12 hours and physical assessment should be for every 4 hours.

Table 1 shows variables and their frequency of age

Variable	Frequency	%
Age		
25-35 years	220	55%
36-45	80	20%
50-55	60	15%
70-80	40	10%

Table 2 shows variables and their frequency of gender

Variable	Frequency	%
Males	220	55%
Females	180	45%

Table 3 shows percentage of physical signs

Variable	Frequency	%
Pulmonary edema	118	29.5%
Acidotic breathing	25	6.2%
Anuria	59	14.7%
Oliguria	220	55%
Uremic encephalopathy	43	10.7%

Figure 01:

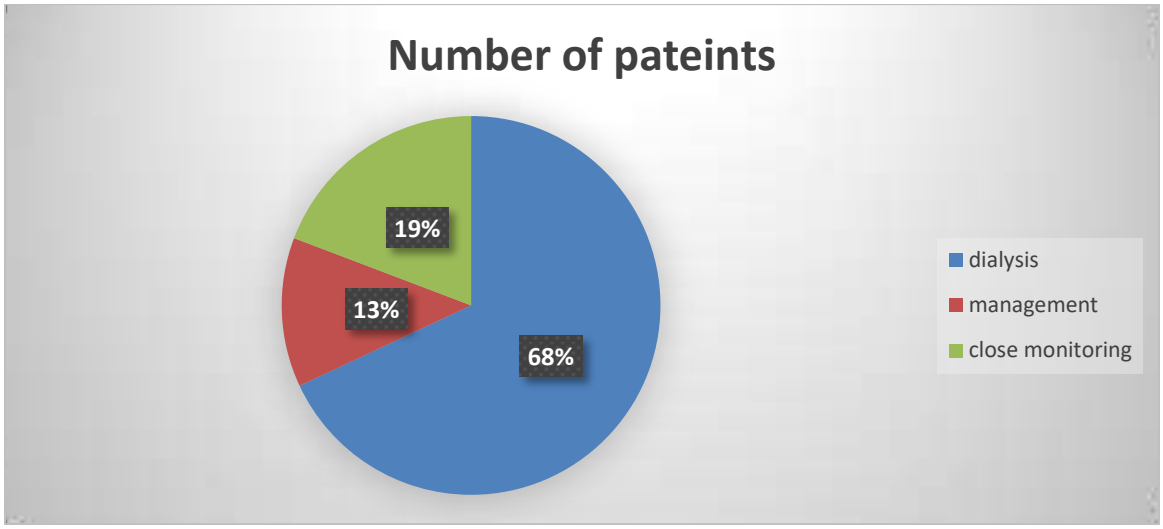


Figure 02: Percentage of males and females

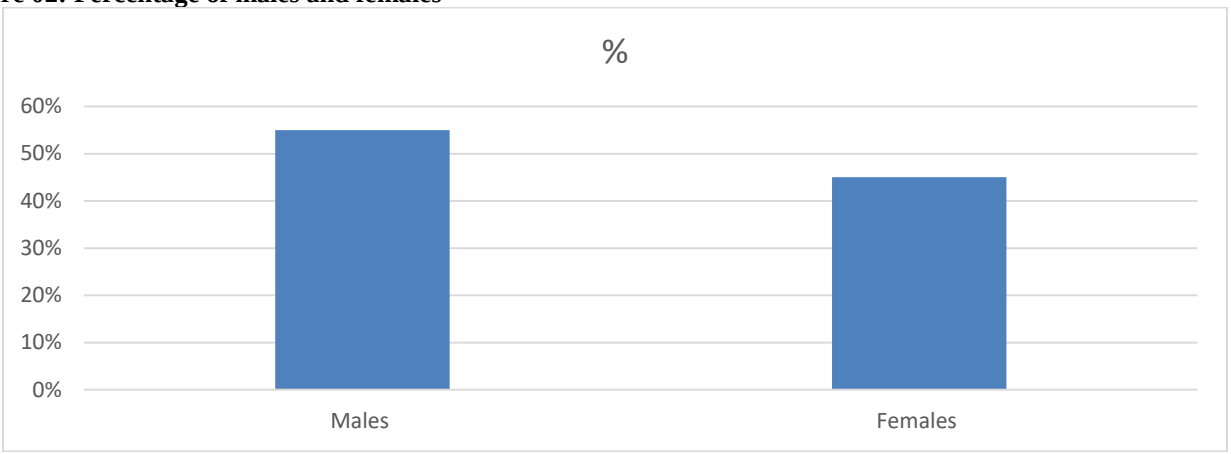
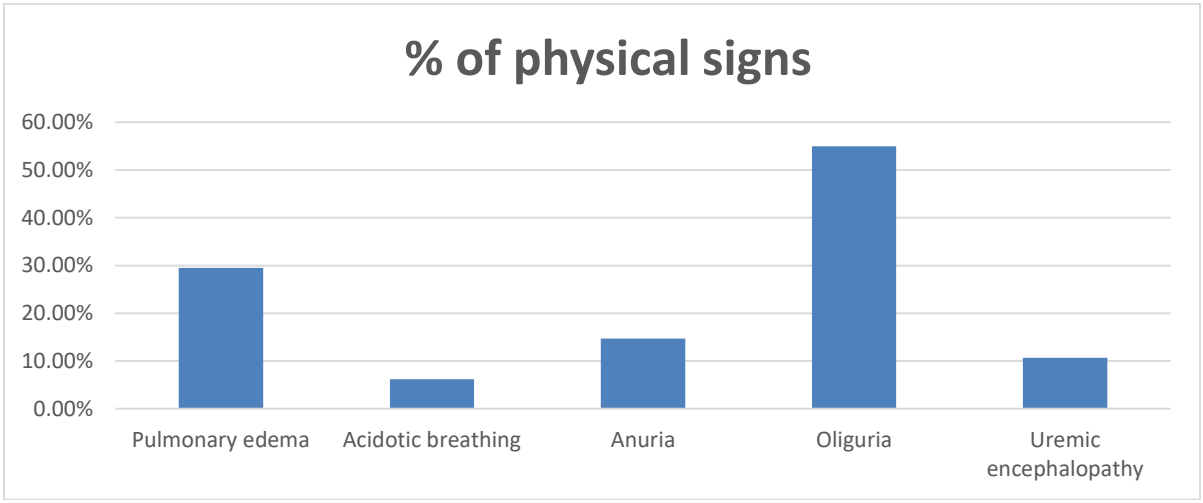


Figure 03:



Discussion

The present study involving 400 patients provides valuable insights into the demographic distribution, etiology, clinical manifestations, and management strategies of renal failure. The data reveals a notable distribution across various age groups, with the majority of cases concentrated in the 25-35 years age bracket, followed by 36-45 years and 50-55 years. Interestingly, there is a lower incidence reported in the age group of 70-80 years, suggesting a potential age-related trend in renal failure cases [8-9].

In terms of gender distribution, males constitute the majority, comprising 55% of the cases, while females account for 45%. This gender discrepancy could be attributed to variations in lifestyle factors, genetic predispositions, or occupational exposures that may contribute to renal complications. Further exploration into these factors could enhance our understanding of the observed gender distribution [10-11].

The primary causes of renal failure are highlighted, with end-stage renal disease (ESRD) emerging as the leading cause, requiring renal replacement therapy (RRT) or hemodialysis (HD). Acute renal failure (ARF), particularly post-gastroenteritis renal failure, constitutes a significant proportion of cases [12-15]. This underscores the diverse etiological factors contributing to renal failure and the importance of distinguishing between chronic and acute forms for appropriate management [16-17].

The clinical presentation of renal failure is well-documented, with oliguria being the most common sign observed in 58% of cases. This is followed by pulmonary edema (32%), uremic encephalopathy (18%), and acidotic breathing (8%). These findings align with established literature on renal failure symptoms, emphasizing the importance of early recognition and intervention to mitigate complications [19-20]. Schiffl H and colleagues reviewed 10-year data of 7404 patients from the Michigan Kidney Registry to evaluate the rate and associated factors for recovery of renal function.

The study further stratifies patients based on their management requirements. Approximately 53% of patients (212 cases) necessitate dialysis, underscoring the severity of their renal dysfunction. Conversely, 18.75% of patients (75 cases) do not require immediate dialysis but rather demand close monitoring and management based on regular biochemical assessments. Similar study was done by Chen YC et al.

Moreover, the frequency of physical assessments is outlined, emphasizing the need for vigilant monitoring, particularly in cases requiring close observation. Patients necessitating dialysis, as well as those under close monitoring, form crucial subgroups that demand distinct clinical approaches for optimal care [21-23].

This study offers a comprehensive overview of renal failure in a sizable patient cohort. The detailed analysis of demographic characteristics, etiological factors, clinical presentations, and management requirements provides a foundation for improving our understanding of renal failure patterns and tailoring effective interventions.

Conclusion

The majority of cases occur in younger age groups (25-35 years), suggesting a potential age-dependent pattern in renal failure susceptibility. Males exhibit a higher prevalence compared to females, highlighting the need to investigate contributing lifestyle factors, genetic predispositions, or occupational hazards specific to each gender. End-stage renal disease and acute renal failure, particularly post-gastroenteritis, emerge as primary causes, emphasizing the importance of distinguishing between chronic and acute forms for tailored management. Oliguria is the most frequent symptom, followed by pulmonary edema, uremic encephalopathy, and acidotic breathing, underscoring the significance of early recognition for preventative interventions. Dialysis is necessary for over half of the patients, while others require close monitoring and biochemical assessments, highlighting the need for individualized treatment plans based on disease severity and progression. Further research could delve into the underlying factors influencing age and gender distribution, contributing to the refinement of prevention and management strategies for renal failure.

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