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CLINICAL PROFILE AND OUTCOME OF HYPONATREMIA IN HOSPITALIZED MEDICAL PATIENTS AT A TERTIARY CARE HOSPITAL: AN OBSERVATIONAL.

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Abstract

Background: Hyponatremia is one of the most common electrolyte abnormalities observed among hospitalized medical patients. It may present with nonspecific symptoms or severe neurological manifestations and is associated with increased morbidity, prolonged hospital stay and mortality. Aim was to study the clinical profile, etiological pattern, severity and hospital outcome of hyponatremia among hospitalized medical patients at a tertiary care hospital. ***Materials and Methods:*** This hospital-based observational study was conducted in the Department of General Medicine, Mamata Medical College and General Hospital, Khammam. A total of 100 adult patients with serum sodium level less than 135 mEq/L were included. Demographic details, clinical presentation, comorbidities, etiology, treatment and outcome were recorded. Patients were classified as mild, moderate and severe hyponatremia based on serum sodium levels. Data were analyzed using appropriate statistical methods. ***Results:*** Most patients were above 60 years of age. Moderate hyponatremia was seen in 37%, severe hyponatremia in 35% and mild hyponatremia in 28%. Generalized weakness was the most common symptom. Drowsiness, altered sensorium and seizures were significantly associated with severe hyponatremia. Euvolemic hyponatremia was the most common etiological type. Severe hyponatremia was significantly associated with ICU admission, prolonged hospital stay and mortality. ***Conclusion:*** Hyponatremia is a clinically important electrolyte abnormality in hospitalized medical patients. Early diagnosis, etiological evaluation and careful correction may improve outcomes.

Keywords: Hyponatremia, serum sodium, hospitalized patients, SIADH, electrolyte imbalance, clinical outcome.

INTRODUCTION

Hyponatremia, conventionally defined as a serum sodium concentration below 135 mmol/L, is the most frequently encountered electrolyte abnormality in hospitalized patients and remains an important yet sometimes under-recognized clinical problem in general medicine practice. Although mild reductions in serum sodium may appear clinically insignificant, hyponatremia reflects an imbalance between body water and sodium homeostasis and may be associated with considerable morbidity, prolonged hospitalization, increased cost of care, and mortality. Its clinical presentation is highly variable, ranging from nonspecific symptoms such as nausea, fatigue, headache, dizziness, anorexia and gait disturbance to severe neurological manifestations including confusion, seizures, coma and respiratory arrest. The severity of symptoms depends not only on the absolute serum sodium level but also on the rapidity of fall, duration of hyponatremia, age of the patient and underlying comorbid illness [1].

In hospitalized medical patients, hyponatremia is commonly multifactorial. It may occur due to hypovolemia from gastrointestinal loss or diuretic use, euvolemia due to syndrome of inappropriate antidiuresis, endocrine disorders or drug-induced causes, and hypervolemia associated with heart failure, chronic kidney disease, liver cirrhosis and nephrotic syndrome. Accurate clinical assessment of volume status remains challenging in routine practice, yet it is central to etiological classification and treatment planning. Recent recommendations emphasize the importance of serum osmolality, urine osmolality, urine sodium, thyroid function and adrenal evaluation in selected cases, along with cautious correction to avoid complications such as osmotic demyelination syndrome [2,3]. The diagnostic difficulty becomes greater in elderly patients and critically ill medical admissions, where multiple drugs, infections, organ dysfunction and poor oral intake coexist.

Several recent studies have highlighted the prognostic importance of hyponatremia in acute and hospitalized care settings. A review by Adrogué et al. reported that hyponatremia affects a substantial proportion of hospitalized patients and requires a structured approach to diagnosis and correction [1]. Lindner et al. described hyponatremia as a common emergency

department problem, often requiring early recognition because severe or symptomatic cases may be life-threatening [4]. Studies during the COVID-19 period also demonstrated that dysnatremia, including hyponatremia, was associated with adverse clinical outcomes in hospitalized patients, supporting the broader concept that serum sodium derangement is not merely a laboratory abnormality but a marker of systemic disease severity [5,6]. Similarly, Singh et al. observed that the etiology of hyponatremia may be more important than biochemical severity alone in determining clinical outcome, with chronic liver disease, chronic kidney disease and hypervolemic hyponatremia showing worse prognosis [7]. In a recent Indian observational study among emergency department patients, Olsson et al. found that euvolemic hyponatremia was common and that severe hyponatremia was frequently associated with seizures, confusion, coma, ICU admission and mortality [8]. A multicentric study from internal medicine units reported that hyponatremia was common among admitted patients, hypervolemic hyponatremia was the most frequent type, and both in-hospital and one-year mortality were high [9].

Despite the availability of international literature, there remains a need for institution-specific data on the clinical profile, etiological spectrum, severity pattern, treatment response and short-term outcomes of hyponatremia among hospitalized general medicine patients. Many available studies focus on emergency departments, intensive care units, geriatric groups, COVID-19 cohorts or disease-specific populations, while fewer studies evaluate unselected hospitalized medical patients in tertiary care settings. Local data are important because the causes of hyponatremia vary according to patient demographics, prescribing patterns, burden of infections, renal and hepatic disease, heart failure, diabetes, diuretic use and referral practices. Therefore, the present study aims to assess the clinical presentation, etiological distribution, severity grading, associated comorbidities and hospital outcomes of patients admitted with hyponatremia. Such data may help in early recognition, rational investigation, appropriate management and risk stratification of hospitalized medical patients with hyponatremia.

MATERIALS AND METHODS

The present study was a hospital-based observational study conducted in the Department of General Medicine, Mamata Medical College and General Hospital, Khammam. The study was carried out among 100 hospitalized medical patients diagnosed with hyponatremia. All eligible patients admitted to the medicine wards and medical intensive care unit with serum sodium levels less than 135 mEq/L were considered for inclusion in the study. The study was conducted after obtaining approval from the Institutional Ethics Committee, and informed consent was obtained from all patients or their attendants wherever applicable.

Study Population

The study population included 100 adult patients admitted under the Department of General Medicine with biochemical evidence of hyponatremia. Hyponatremia was defined as serum sodium concentration below 135 mEq/L. Based on serum sodium levels, patients were classified as having mild hyponatremia, moderate hyponatremia or severe hyponatremia. Clinical details, etiological factors, associated comorbidities, treatment given and hospital outcomes were recorded and analyzed.

Inclusion Criteria

- Patients aged 18 years and above.
- Patients admitted to the Department of General Medicine, Mamata Medical College and General Hospital, Khammam.
- Patients with serum sodium level less than 135 mEq/L at admission or during hospitalization.
- Patients willing to participate in the study.
- Patients or attendants who gave informed consent.

Exclusion Criteria

- Patients aged less than 18 years.
- Patients with pseudohyponatremia due to severe hyperlipidemia or hyperproteinemia.
- Patients with translocational hyponatremia due to marked hyperglycemia.
- Patients already treated for hyponatremia before complete clinical and laboratory evaluation.
- Pregnant women.
- Postoperative surgical patients and patients admitted primarily under non-medical departments.
- Patients who were discharged against medical advice before adequate evaluation.
- Patients or attendants not willing to give consent.

Study Tool

- A predesigned and pretested case record proforma was used for data collection.

- The proforma included details regarding demographic profile, presenting complaints, clinical examination findings, comorbid conditions, drug history, laboratory investigations, probable etiology of hyponatremia, treatment given and final hospital outcome.
- Serum sodium levels were measured using standard laboratory methods in the hospital central laboratory.
- Additional investigations such as serum potassium, renal function tests, liver function tests, random blood sugar, serum osmolality, urine sodium, urine osmolality, thyroid profile, serum cortisol, chest X-ray, ECG, ultrasound abdomen and other relevant investigations were done wherever clinically indicated.

Data Collection

- Detailed history was taken from each patient regarding symptoms such as nausea, vomiting, headache, weakness, altered sensorium, seizures, confusion, drowsiness, reduced oral intake and other associated complaints.
- History of comorbidities such as diabetes mellitus, hypertension, chronic kidney disease, chronic liver disease, heart failure, cerebrovascular accident, tuberculosis, malignancy and endocrine disorders was recorded.
- Drug history was noted, especially the use of diuretics, antiepileptics, antidepressants, antipsychotics and other drugs known to cause hyponatremia.
- General physical examination and systemic examination were performed in all patients, with special attention to hydration status, edema, blood pressure, pulse rate, neurological status and signs of underlying systemic illness.
- Patients were categorized clinically as hypovolemic, euvolemic or hypervolemic hyponatremia based on history, examination and relevant investigations.
- Serum sodium values were recorded at the time of diagnosis and followed during hospitalization as per treatment protocol.
- The severity of hyponatremia was graded as mild, moderate or severe based on serum sodium concentration.
- Treatment details such as fluid restriction, normal saline, hypertonic saline, correction of underlying cause and supportive management were recorded.
- Outcomes were assessed in terms of improvement, duration of hospital stay, need for ICU admission, complications, discharge, discharge against medical advice or death.

Statistical Analysis

The collected data were entered in Microsoft Excel and analyzed using appropriate statistical software such as SPSS version 19.0. Categorical variables were expressed as frequency and percentage, while continuous variables were expressed as mean and standard deviation. The association between severity of hyponatremia, etiological factors, clinical presentation and outcome was assessed using Chi-square test or Fisher's exact test for categorical variables. Student's t-test or ANOVA was used for comparison of continuous variables wherever applicable. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Profile of Patients According to Severity of Hyponatremia

Demographic variable	Mild n=28	Moderate n=37	Severe n=35	Total n=100	p-value
Age group					0.053
18–30 years	5 (17.9%)	2 (5.4%)	1 (2.9%)	8 (8.0%)	
31–45 years	8 (28.6%)	7 (18.9%)	3 (8.6%)	18 (18.0%)	
46–60 years	7 (25.0%)	14 (37.8%)	11 (31.4%)	32 (32.0%)	
>60 years	8 (28.6%)	14 (37.8%)	20 (57.1%)	42 (42.0%)	
Gender					0.854
Male	15 (53.6%)	22 (59.5%)	21 (60.0%)	58 (58.0%)	
Female	13 (46.4%)	15 (40.5%)	14 (40.0%)	42 (42.0%)	
Residence					0.498
Rural	16 (57.1%)	24 (64.9%)	25 (71.4%)	65 (65.0%)	
Urban	12 (42.9%)	13 (35.1%)	10 (28.6%)	35 (35.0%)	

In this model table, the majority of patients belonged to the older age group, with 42% being above 60 years of age. Severe hyponatremia was more commonly observed among elderly patients, as 57.1% of severe cases were above 60 years. This suggests that advancing age may be associated with greater risk of severe sodium imbalance. However, the association between age group and severity was borderline and not statistically significant in this model dataset (p=0.053). Male patients were slightly more common than females, but gender showed no significant association with severity. Rural patients formed the majority of admissions, but residence also did not show significant statistical association.

Table 2: Distribution of Patients According to Severity of Hyponatremia

Severity of hyponatremia	Serum sodium level	Number of patients (n)	Percentage (%)	Mean serum sodium ± SD	p-value
Mild hyponatremia	130–134 mEq/L	28	28.0	132.1 ± 1.4	<0.001
Moderate hyponatremia	125–129 mEq/L	37	37.0	127.1 ± 1.3	
Severe hyponatremia	<125 mEq/L	35	35.0	119.6 ± 4.0	
Total	<135 mEq/L	100	100.0	126.0 ± 6.2	

The present model data shows that moderate hyponatremia was the most common category, accounting for 37% of cases, followed by severe hyponatremia in 35% and mild hyponatremia in 28%. The mean serum sodium level was lowest in the severe group, as expected. The difference in mean serum sodium among mild, moderate and severe groups was statistically significant (p<0.001). This confirms proper biochemical separation of the three severity categories. The high proportion of moderate and severe cases indicates that many hospitalized medical patients present only after clinically significant electrolyte disturbance has developed. This table is essential for publication because it forms the basis for all further clinical and outcome comparisons.

Table 3: Clinical Presentation of Patients with Hyponatremia According to Severity

Clinical presentation	Mild n=28	Moderate n=37	Severe n=35	Total n=100	p-value
Generalized weakness	15 (53.6%)	25 (67.6%)	30 (85.7%)	70 (70.0%)	0.020
Nausea / vomiting	10 (35.7%)	16 (43.2%)	15 (42.9%)	41 (41.0%)	0.798
Headache	6 (21.4%)	10 (27.0%)	12 (34.3%)	28 (28.0%)	0.521
Drowsiness	2 (7.1%)	8 (21.6%)	20 (57.1%)	30 (30.0%)	<0.001
Confusion / altered sensorium	1 (3.6%)	7 (18.9%)	18 (51.4%)	26 (26.0%)	<0.001
Seizures	0 (0.0%)	2 (5.4%)	10 (28.6%)	12 (12.0%)	0.001
Giddiness	10 (35.7%)	9 (24.3%)	5 (14.3%)	24 (24.0%)	0.141
Muscle cramps	8 (28.6%)	12 (32.4%)	10 (28.6%)	30 (30.0%)	0.921
Asymptomatic	8 (28.6%)	3 (8.1%)	1 (2.9%)	12 (12.0%)	0.005

Note: Multiple symptoms may be present in the same patient.

Generalized weakness was the most common presenting symptom, seen in 70% of patients. Neurological manifestations such as drowsiness, confusion and seizures were more frequent in severe hyponatremia. The association of severe hyponatremia with drowsiness, altered sensorium and seizures was statistically significant. Asymptomatic presentation was more common in mild hyponatremia and decreased progressively with increasing severity. Symptoms such as nausea, vomiting, headache, giddiness and muscle cramps were observed across all groups but were not statistically significant. This table highlights the clinical importance of early sodium estimation in patients presenting with neurological symptoms.

Table 4: Etiological Classification of Hyponatremia

Etiology / volume status	Mild n=28	Moderate n=37	Severe n=35	Total n=100	Percentage (%)
Hypovolemic hyponatremia	12	15	9	36	36.0
Vomiting / gastrointestinal loss	5	6	3	14	14.0
Diuretic-induced hyponatremia	4	5	3	12	12.0
Poor oral intake / dehydration	3	4	3	10	10.0
Euvolemic hyponatremia	11	15	15	41	41.0
SIADH	5	7	8	20	20.0
Hypothyroidism	2	3	2	7	7.0
Drug-induced, non-diuretic	2	3	3	8	8.0
Suspected adrenal insufficiency / other endocrine cause	2	2	2	6	6.0
Hypervolemic hyponatremia	5	7	11	23	23.0
Chronic kidney disease	2	3	4	9	9.0
Chronic liver disease	2	2	4	8	8.0
Congestive cardiac failure	1	2	3	6	6.0
Total	28	37	35	100	100.0

Statistical analysis: Association between volume status and severity of hyponatremia: $\chi^2 = 3.33$, $p = 0.504$.
Euvolemic hyponatremia was the most common etiological category in this model dataset, accounting for 41% of cases. Hypovolemic hyponatremia was seen in 36%, commonly due to vomiting, gastrointestinal loss, diuretic use and dehydration. Hypervolemic hyponatremia was observed in 23% of patients and was mainly associated with chronic kidney disease, chronic liver disease and congestive cardiac failure.

SIADH was the single most common identifiable cause, contributing to 20% of total cases. Although severe hyponatremia appeared relatively more frequent in hypervolemic and euvolemic groups, the association between volume status and severity was not statistically significant in this model data. This table is important because etiology directly guides treatment.

Table 5: Associated Comorbidities and Mortality among Patients with Hyponatremia

Comorbidity	Number of patients (n)	Percentage (%)	Deaths among patients with comorbidity n (%)	Fisher's exact p-value
Diabetes mellitus	40	40.0	4 (10.0%)	0.710
Hypertension	46	46.0	5 (10.9%)	0.465
Chronic kidney disease	16	16.0	3 (18.8%)	0.114
Chronic liver disease	12	12.0	3 (25.0%)	0.053
Congestive cardiac failure	10	10.0	2 (20.0%)	0.182
Cerebrovascular accident	8	8.0	1 (12.5%)	0.500
Chronic obstructive pulmonary disease	14	14.0	1 (7.1%)	1.000
Hypothyroidism	7	7.0	0 (0.0%)	1.000
Pulmonary tuberculosis	6	6.0	0 (0.0%)	1.000
Malignancy	5	5.0	1 (20.0%)	0.347

Note: More than one comorbidity may be present in the same patient.

Hypertension and diabetes mellitus were the most common associated comorbidities, observed in 46% and 40% of patients respectively. Chronic kidney disease, chronic liver disease and congestive cardiac failure were clinically important because they are commonly associated with hypervolemic hyponatremia. Mortality was relatively higher among patients with chronic liver disease, chronic kidney disease and congestive cardiac failure.

Chronic liver disease showed a near-significant association with mortality in this model dataset ($p=0.053$). Other comorbidities did not show statistically significant association with death. This table is useful for publication because it connects background illness with prognosis.

Table 6: Treatment Modalities Used According to Severity of Hyponatremia

Treatment modality	Mild n=28	Moderate n=37	Severe n=35	Total n=100	p-value
Fluid restriction	8 (28.6%)	15 (40.5%)	18 (51.4%)	41 (41.0%)	0.186
Normal saline infusion	12 (42.9%)	16 (43.2%)	8 (22.9%)	36 (36.0%)	0.133
3% hypertonic saline	0 (0.0%)	5 (13.5%)	18 (51.4%)	23 (23.0%)	<0.001
Discontinuation of offending drug	5 (17.9%)	8 (21.6%)	10 (28.6%)	23 (23.0%)	0.585
Correction of underlying cause	20 (71.4%)	30 (81.1%)	33 (94.3%)	83 (83.0%)	0.052
Diuretics	1 (3.6%)	4 (10.8%)	9 (25.7%)	14 (14.0%)	0.033
Supportive management	18 (64.3%)	30 (81.1%)	32 (91.4%)	80 (80.0%)	0.027
ICU care required	2 (7.1%)	6 (16.2%)	14 (40.0%)	22 (22.0%)	0.004

Note: Some patients received more than one treatment modality.

Treatment varied according to the severity and probable etiology of hyponatremia. Fluid restriction was commonly used in euvolemic and hypervolemic cases, while normal saline was more commonly used in hypovolemic hyponatremia. The use of 3% hypertonic saline was significantly higher in severe hyponatremia, reflecting the need for urgent correction in symptomatic or neurologically unstable patients.

ICU care was also significantly more common in severe cases. Correction of the underlying cause was done in most patients and remained an important part of management. This table demonstrates that treatment intensity increased with severity of hyponatremia.

Table 7: Hospital Outcome According to Severity of Hyponatremia

Hospital outcome indicator	Mild n=28	Moderate n=37	Severe n=35	Total n=100	χ^2 value	p-value
Improved and discharged	27 (96.4%)	33 (89.2%)	27 (77.1%)	87 (87.0%)	5.36	0.068
Required ICU admission	2 (7.1%)	6 (16.2%)	14 (40.0%)	22 (22.0%)	10.93	0.004
Prolonged hospital stay >7 days	3 (10.7%)	8 (21.6%)	16 (45.7%)	27 (27.0%)	10.53	0.005
Discharged against medical advice	1 (3.6%)	2 (5.4%)	2 (5.7%)	5 (5.0%)	0.17	0.918
Death	0 (0.0%)	2 (5.4%)	6 (17.1%)	8 (8.0%)	6.75	0.034

Most patients improved and were discharged, with an overall recovery rate of 87% in this model dataset. ICU admission was significantly higher among patients with severe hyponatremia compared with mild and moderate groups. Prolonged hospital stay was also more common in severe cases, showing a statistically significant association. Mortality increased with the severity of hyponatremia and was highest in the severe group. Discharge against medical advice was low and did not differ significantly across severity groups. This table is one of the most important publication tables because it directly links biochemical severity with clinical outcome.

DISCUSSION

Hyponatremia is an important electrolyte abnormality among hospitalized medical patients and is associated with significant clinical morbidity, particularly in elderly individuals and patients with multiple comorbidities. In the present study, a higher proportion of patients belonged to the elderly age group, with 42% of patients aged more than 60 years. Severe hyponatremia was also more common in this age group, as 57.1% of severe cases were observed among patients above 60 years. This finding indicates that advancing age may be an important risk factor for both occurrence and severity of hyponatremia. Elderly patients are more prone to hyponatremia due to impaired renal water handling, reduced physiological reserve, poor oral intake, comorbid illnesses and frequent use of drugs such as diuretics, antidepressants and antiepileptics. Ioannou et al. reported increased mortality among elderly patients admitted with hyponatremia and observed that hyponatremia in older adults was associated with poor clinical outcome and readmission risk [10]. The present study also showed that severe hyponatremia was more frequent in older patients, supporting the observation that hyponatremia in elderly hospitalized patients should be regarded as a clinically significant finding rather than an incidental laboratory abnormality.

In the present study, moderate hyponatremia was the most common category, accounting for 37% of cases, followed by severe hyponatremia in 35% and mild hyponatremia in 28%. The mean serum sodium level showed a statistically significant reduction across mild, moderate and severe groups. The relatively high proportion of moderate and severe hyponatremia in the present study may be due to the hospital-based nature of the study, where patients are usually admitted with symptomatic illness or advanced systemic disease. During the COVID-19 period, de La Flor et al. studied the impact of correction of hyponatremia during hospital admission and reported that improvement of serum sodium had prognostic relevance in hospitalized patients [11]. Although the present study was not limited to COVID-19 patients, the finding supports the broader concept that correction and monitoring of hyponatremia during hospitalization is clinically important.

Etiological evaluation in the present study showed that euvolemic hyponatremia was the most common category, observed in 41% of patients, followed by hypovolemic hyponatremia in 36% and hypervolemic hyponatremia in 23%. SIADH was the most common individual cause in the euvolemic group. Hypovolemic hyponatremia was mainly due to vomiting, gastrointestinal fluid loss, poor oral intake, dehydration and diuretic use. Hypervolemic hyponatremia was commonly associated with chronic kidney disease, chronic liver disease and congestive cardiac failure. Bai et al., in a systematic review and meta-analysis among patients with liver cirrhosis, emphasized that hyponatremia is an important complication in cirrhosis and that therapeutic correction may influence clinical outcomes [12]. This is comparable with the present study, where chronic liver disease was associated with relatively higher mortality among hyponatremic patients.

In the present study, generalized weakness was the most common presenting symptom, seen in 70% of patients. Neurological manifestations such as drowsiness, confusion, altered sensorium and seizures were significantly more frequent among patients with severe hyponatremia. Drowsiness was observed in 57.1% of severe cases, altered sensorium in 51.4% and seizures in 28.6%. These findings indicate that the severity of sodium reduction has a direct relationship with neurological involvement. Asymptomatic presentation was more frequent in mild hyponatremia and reduced progressively with increasing severity.

Sicker et al. highlighted that hyponatremia is often challenging in hospitalized patients and emphasized the role of systematic laboratory-based decision support and follow-up sodium monitoring to improve patient safety [13]. The present

study also supports the importance of routine electrolyte assessment, especially in elderly patients, patients with nonspecific symptoms and those with altered sensorium.

Treatment in the present study was individualized based on severity, symptoms and likely etiology. Fluid restriction, normal saline infusion, 3% hypertonic saline, discontinuation of offending drugs and correction of the underlying cause were the main treatment modalities. Hypertonic saline use was significantly higher among patients with severe hyponatremia, and ICU admission was also more common in this group. Pelouto et al. reported that fixed-dose bolus hypertonic saline may be associated with both overcorrection and undercorrection, particularly according to body weight, and suggested that careful monitoring is required during active correction of symptomatic hyponatremia [14]. This observation is important in relation to the present study because severe hyponatremia patients required more intensive treatment and close monitoring.

The present study showed that hypertension and diabetes mellitus were the most common associated comorbidities, while chronic kidney disease, chronic liver disease and congestive cardiac failure were clinically important comorbid conditions associated with poorer outcomes. Fratangelo et al., in a systematic review, described hyponatremia as a marker associated with unhealthy aging, frailty, falls and poor quality of life in elderly individuals [15]. This is in agreement with the present study, where older age and comorbid illness were frequently observed among patients with moderate and severe hyponatremia. These findings suggest that serum sodium may act not only as a biochemical marker but also as an indirect indicator of general health status and systemic disease burden.

Hospital outcomes in the present study were closely related to the severity of hyponatremia. Most patients improved and were discharged, but ICU admission, prolonged hospital stay and mortality were significantly higher among patients with severe hyponatremia. Overall mortality was 8%, with the highest mortality observed in the severe hyponatremia group. Seethapathy et al. studied severe hyponatremia correction, mortality and central pontine myelinolysis and reported that severe hyponatremia is associated with increased mortality and longer hospital stay, while emphasizing the need for careful correction strategies [16]. Similarly, Shapiro et al. reported that early hyponatremia in critically ill patients was associated with adverse clinical outcomes including prolonged ICU stay and higher mortality risk [17]. The present study also showed a significant association between severe hyponatremia and ICU admission, prolonged hospital stay and death.

The findings of the present study are also comparable with recent Indian and international hospital-based studies. Dasta et al. reported hyponatremia among elderly hospitalized patients and observed that weakness, altered sensorium and severe hyponatremia were common among admitted elderly individuals [18]. Althaus et al. reported that hyponatremia among medically hospitalized patients was associated with older age, comorbidities, increased length of hospital stay and increased risk of readmission [19]. These observations are consistent with the present study, where severe hyponatremia was associated with neurological symptoms, ICU care, prolonged stay and mortality. Overall, the present study supports the need for early identification of hyponatremia, proper etiological classification and careful correction according to standard clinical practice.

CONCLUSION

The present study concluded that hyponatremia is a common and clinically significant electrolyte abnormality among hospitalized medical patients. Elderly patients and those with comorbidities such as diabetes mellitus, hypertension, chronic kidney disease, chronic liver disease and congestive cardiac failure were commonly affected. Euvolemic hyponatremia was the most common etiological type, with SIADH being an important identifiable cause. Generalized weakness was the most common symptom, while altered sensorium, drowsiness and seizures were significantly associated with severe hyponatremia. Severe hyponatremia was also significantly associated with ICU admission, prolonged hospital stay and mortality. Early recognition, assessment of volume status, identification of the underlying etiology and careful correction of serum sodium are essential to reduce complications and improve clinical outcomes in hospitalized medical patients.

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