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Original Research Article.

A Hospital Based Observational Study on Clinical Profile of Hyponatremia in Elderly

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ABSTRACT

Introduction: Hyponatremia, which is defined as a plasma sodium concentration less than (<) 135mmol/L, is a very common disorder and can occur in up to 22% of hospitalised patients. Its prevalence among non-hospitalised elderly patients has been estimated to be between 7% to 11.4%, increasing to 11% to 22.5% among the hospitalised patients. It is also the most common dyselectrolytemia seen in the geriatric population which occurs due to impaired water and electrolytes balance in response to diet, drugs and environmental changes.

Aims and Objectives: The aims of the study were to describe the clinical features and different causes of hyponatremia in hospitalised elderly patients and to find out the types of hyponatremia and to assess the short term outcomes during hospital stay.

Methods and Materials: The study was a hospital based observational study conducted in Medicine Department and Geriatric Regional Centre, Gauhati Medical College and Hospital, Guwahati for a period of one year from August 2017 to September 2018. Ethical clearance was obtained from the ethical committee. A total of 106 patients with hyponatremia were included in the study with aged greater than or equal to (≥) 60 years.

Results and Observations: The mean age was 70.04 years with a standard deviation of 6.73 years. Male and Female ratio was 1: 1.12. The mean serum sodium level was 124.8 mmol/L with a standard deviation of 5.8 mmol/L. Altered sensorium (48 cases, 45.3%) was the most common presenting symptom followed by lethargy (21 cases ,19.8%). The most common etiology was found to be SIADH (32 cases, 30.2%) followed by renal failure (19 cases, 18%) and intake of drugs like diuretics (18 cases, 17%). Among SIADH majority of the cases were found to have pneumonia (12 cases, 37.5%) followed by stroke (9 cases, 28.1%) and brain infections like meningitis and encephalitis (5 cases, 15.6%). In hyponatremia, majority of the cases was found to be in euvolemic status (55 cases, 51.9%). The overall mortality of hyponatremic patients was 8.5%. Short term outcomes in patients with comorbid condition like chronic kidney disease was found to be significantly higher (p value=0.0396).

Conclusion: Hyponatremia is a very common dyseletrolytemia and clinical problem encountered in the elderly population and is associated with high morbidity and mortality particularly when associated with comorbidities.

Keywords: Hyponatremia, Dyselectrolytemia, SIADH, Comorbidities.

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INTRODUCTION

Hyponatremia is defined as a plasma sodium concentration less than (<) 135mmol/L, is a very common disorder, can occur up to 22% of hospitalised patients and is a common dyselectrolytemia seen in the geriatric population.[1] Its prevalence is estimated to be between 18 to 22.3% in elderly population by various studies.[2] It occurs due to impaired water and electrolytes balance in response to diet, drugs and environmental changes.[3]

Serum osmolarity and serum sodium concentration are normally maintained in our body by various homeostatic mechanism that involves thirst, antidiuretic hormone (ADH) and renal handling of filtered sodium.[4]

Both hyponatremia and hypernatremia can cause substantial morbidity and mortality and ironically, incorrect treatment can lead to various complications.[5] Neuropsychatric manifestations due to hyponatremia is one of the treatable cause of electrolyte disorder. Early diagnosis and prompt treatment is essential to save the patient from fatal complications such as osmotic demyelination syndrome.[6]

The clinical manifestations of hyponatremia are produced by swelling of brain tissue and the early symptoms of hyponatremia are usually anorexia, nausea, vomiting. Some patients may also have headache and irritability.[1] As serum sodium levels falls further, patients develop neuropsychiatry symptoms including lethargy, psychosis and seizure, which is also known as hyponatremic encephalopathy.[6] As per the limited pre-existing data, therefore keeping in point of view the clinical features, etiologies and outcomes of hyponatremia in elderly were taken up with the following aims and objectives.

AIMS AND OBJECTIVES

1. To study clinical profile of hyponatremia in hospitalised elderly patients.
2. To find out the types of hyponatremia in hospitalised elderly patients.
3. To assess the short term outcomes during hospital stay.

METHODS AND MATERIALS

The study was a hospital based observational study conducted in Medicine Department and Geriatric Regional Centre, Gauhati Medical College and Hospital, Guwahati for a period of one year from August 2017 to September 2018. Ethical clearance was obtained from the ethical committee. A total of 106 patients with hyponatremia were included in the study with aged greater than or equal to (≥) 60 years.

Statistical analysis was done by using Microsoft office Excel 2010, Microsoft office Word 2010 and GraphPadInstat Software. Chi-square test and Fisher's exact test was used for analysis. P value < 0.05 was considered significant in the study.

Inclusion Criteria

1. Patients who are aged greater than or equal to (≥) 60years.
2. Patients with serum sodium less than (<) 135mmol/L.

Exclusion Criteria

1. Patients aged less than (<) 60years.
2. Post-operative patients.

Plasma osmolality was calculated by using following formula: [7]
mosm/kg = 2Na+ (mmol/L) + Glucose (mg/dL)/18 + BUN (mg/dL)/2.8

RESULTS AND OBSERVATIONS

The mean age was 70.04 years with a standard deviation of 6.73 years. (Range 60 – 90 years)

In this study, 50 were males (47.2% cases) and 56 were females (52.8% cases). Male and Female ratio was1:1.12.

The mean serum sodium was 124.8 mmol/L with a standard deviation of 5.8 mmol/L.

The most common presentation was found to be altered sensorium. (48 cases, 45.3%).Seizure was found in 5 cases (4.7%). Majority of the patients had SIADH as the most common cause (32 cases, 30.2%).

Total number of cases with SIADH was 32 cases (30.2%). Most common cause of SIADH was found to be pneumonia. (12 cases, 37.5%) In this study, majority of patients belong to Euvolemic status, found in 55 cases (51.9%). Hypervolemic were found in 34 cases (32.1%). Hypovolemic were found in 17 cases (16%).

Total 9 patients died. The overall mortality of hyponatremic patients was 8.5% in this study. This association between the outcomes and the serum sodium level was not found to be statistically significant.

The outcomes of the patients was related with different comorbid conditions. 6 patients (5.7%) died due to chronic kidney disease. This association is found to be statistically significant (p value= 0.0396). 2 patients (1.8%) died due to dilated cardiomyopathy. 1 patient (1%) died due to chronic obstructive pulmonary disease.

Figure 1: Age Distribution

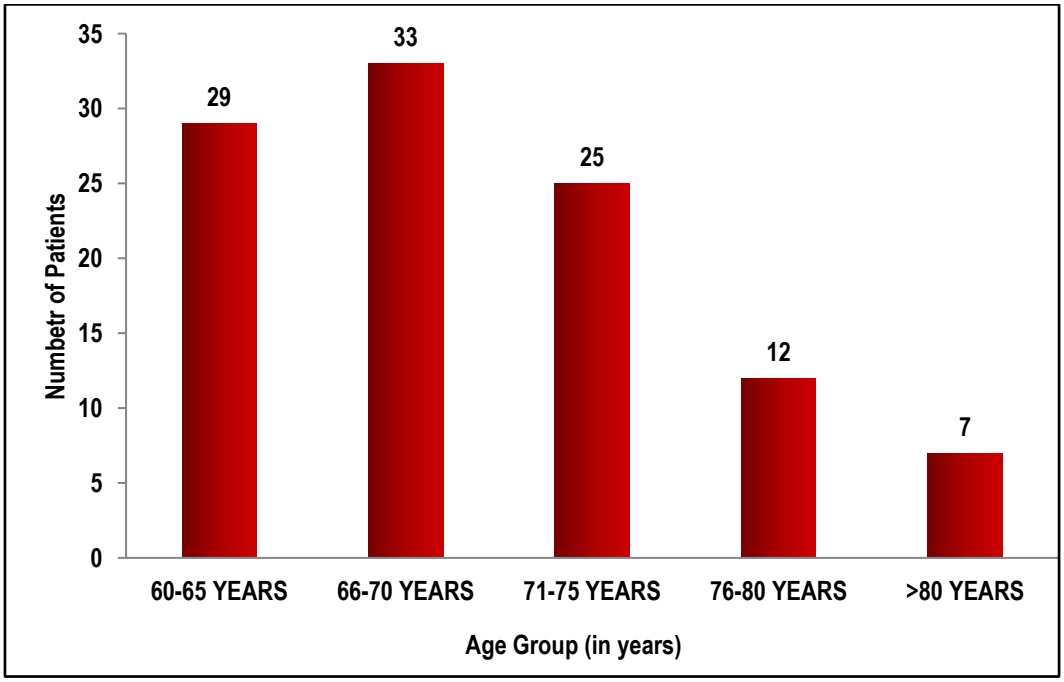


Figure 2: Sex Distribution

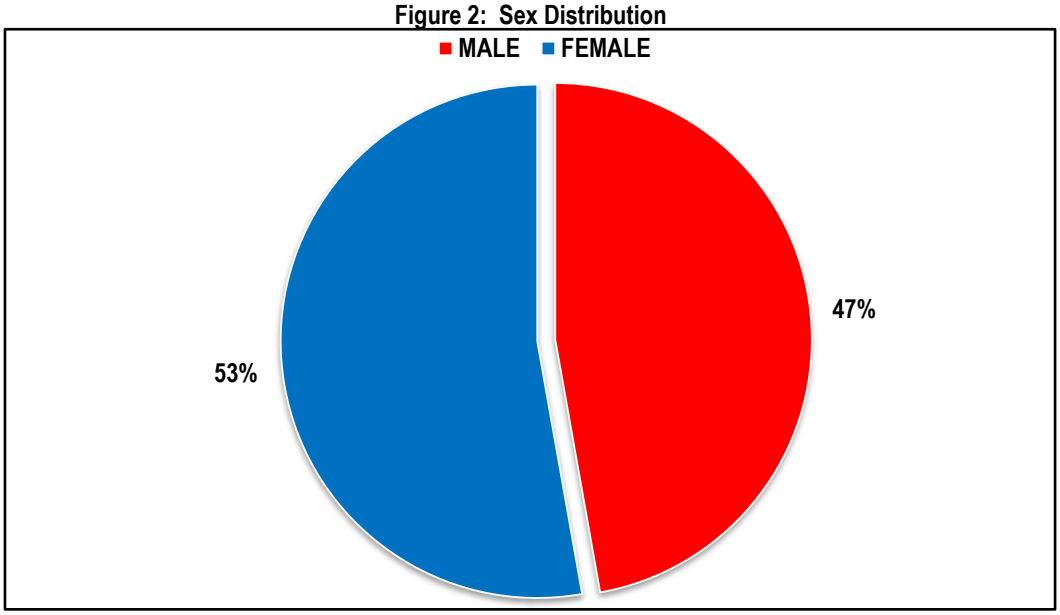


Figure 3: Severity of Hyponatremia

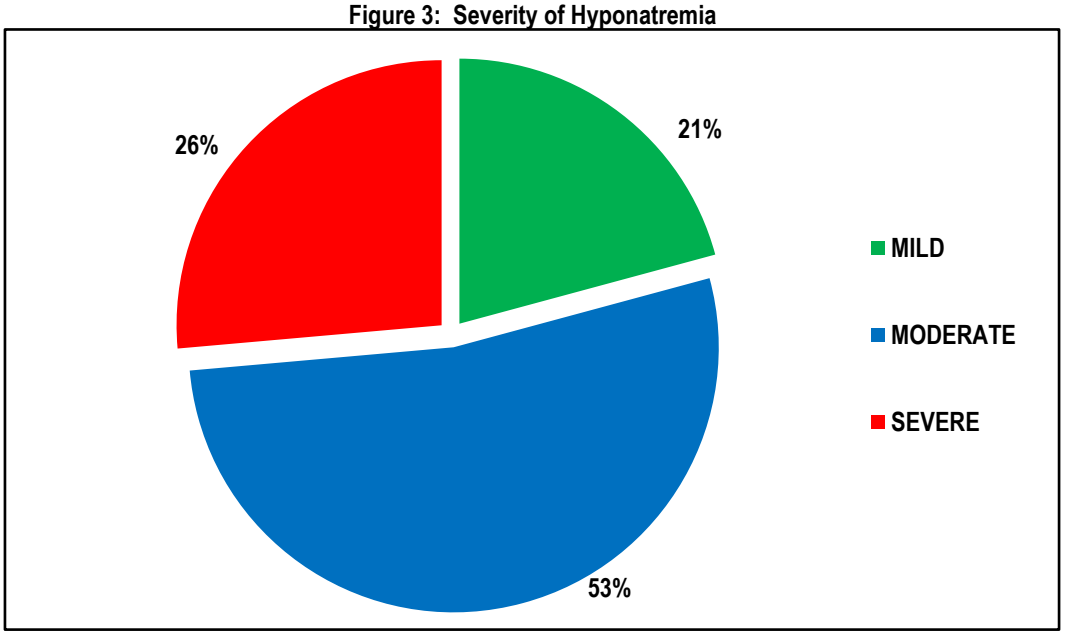


Figure 4: Distribution of Presenting Symptoms

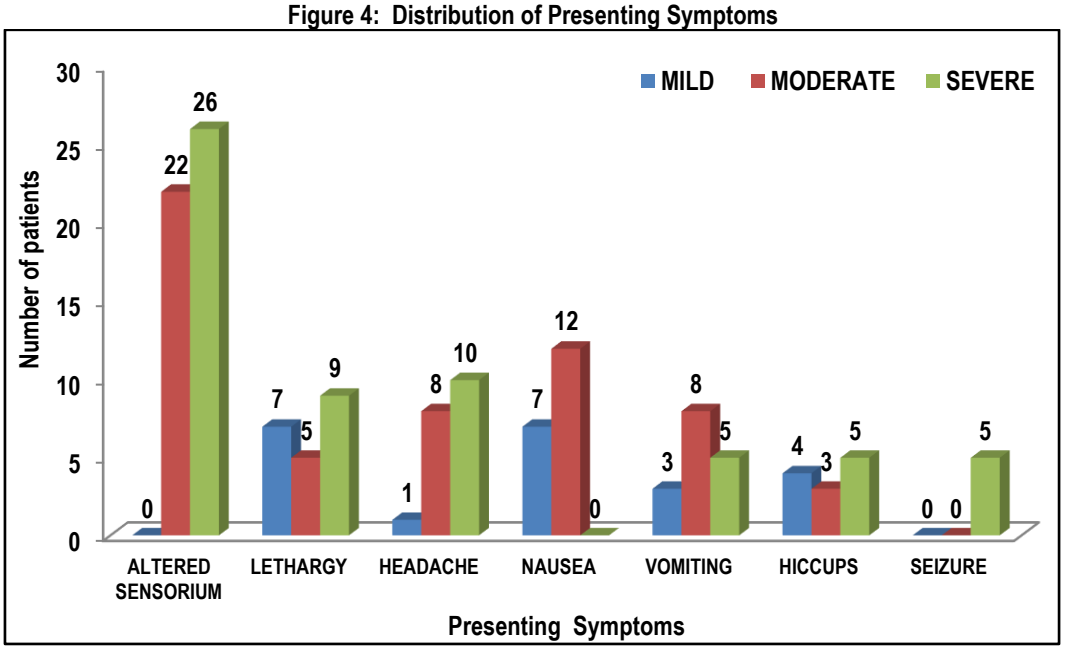


Figure 5: Etiology of Hyponatremia

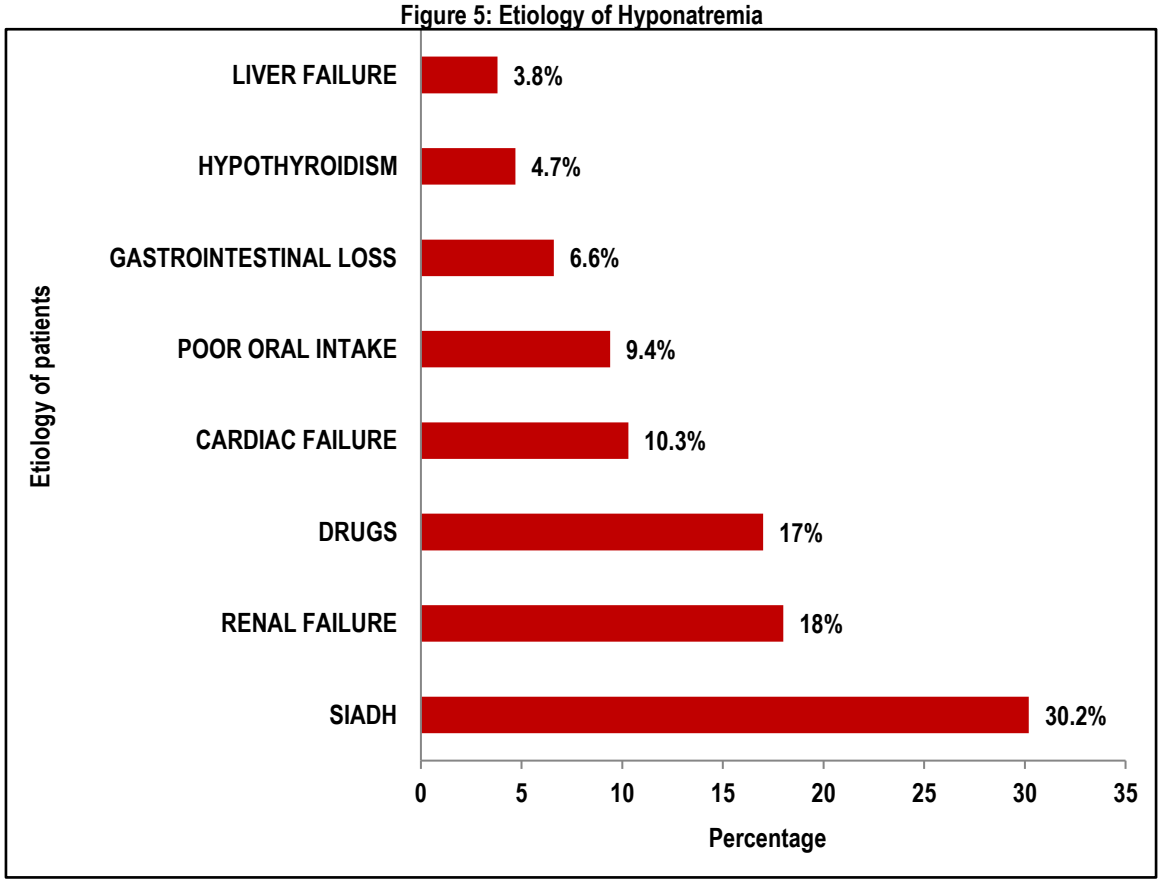


Figure 6: Distribution of Probable Causes Of SIADH (In Percentage)

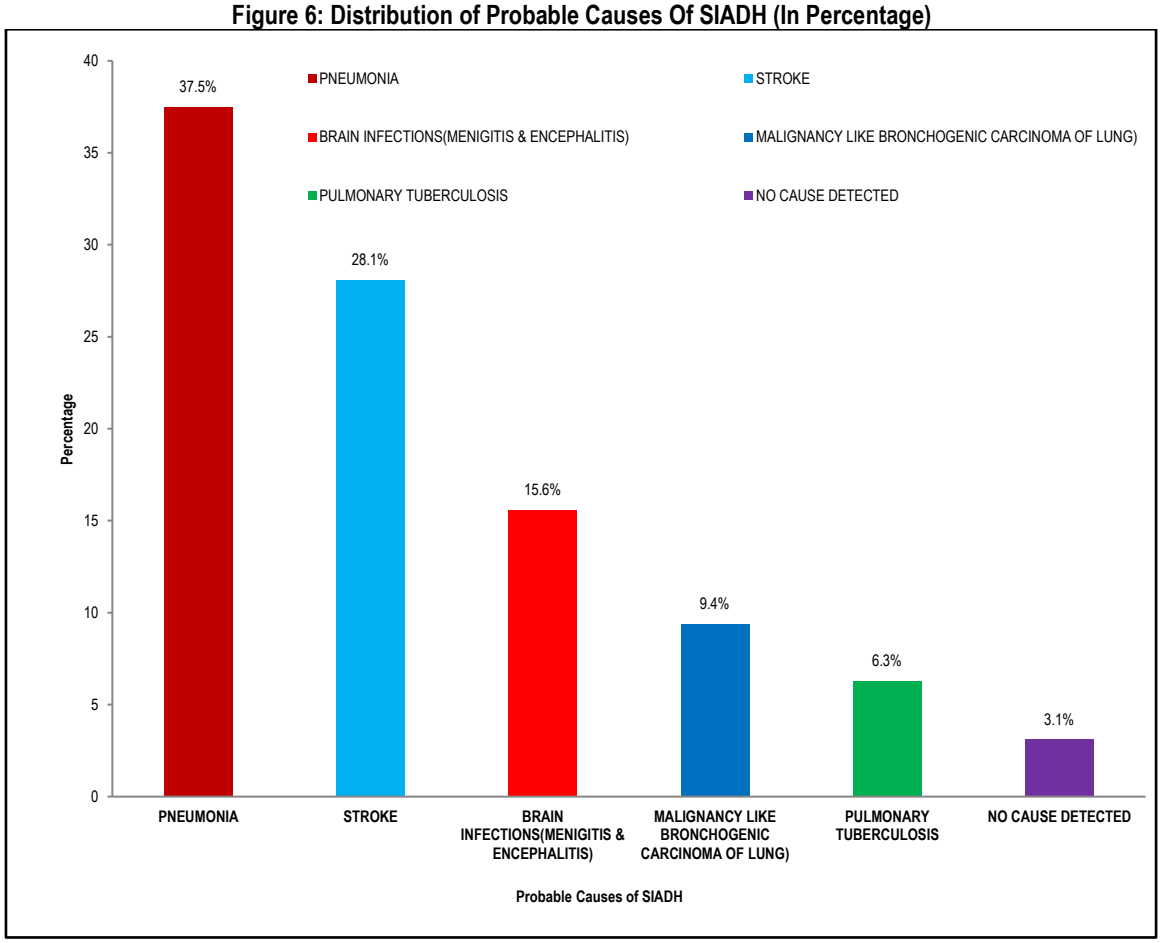


Figure 7: Types Of Hyponatremia Based On Hydration Status (In Percentage)

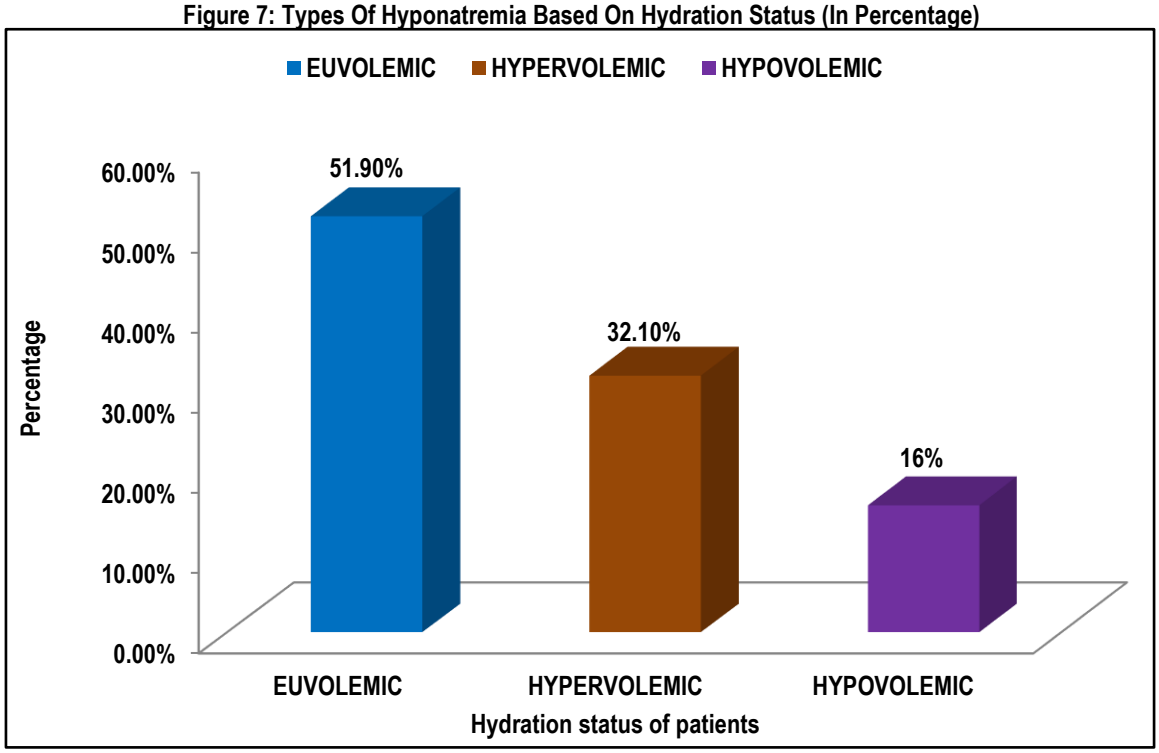


Figure 8: Distribution of Comorbidities (In Percentage)

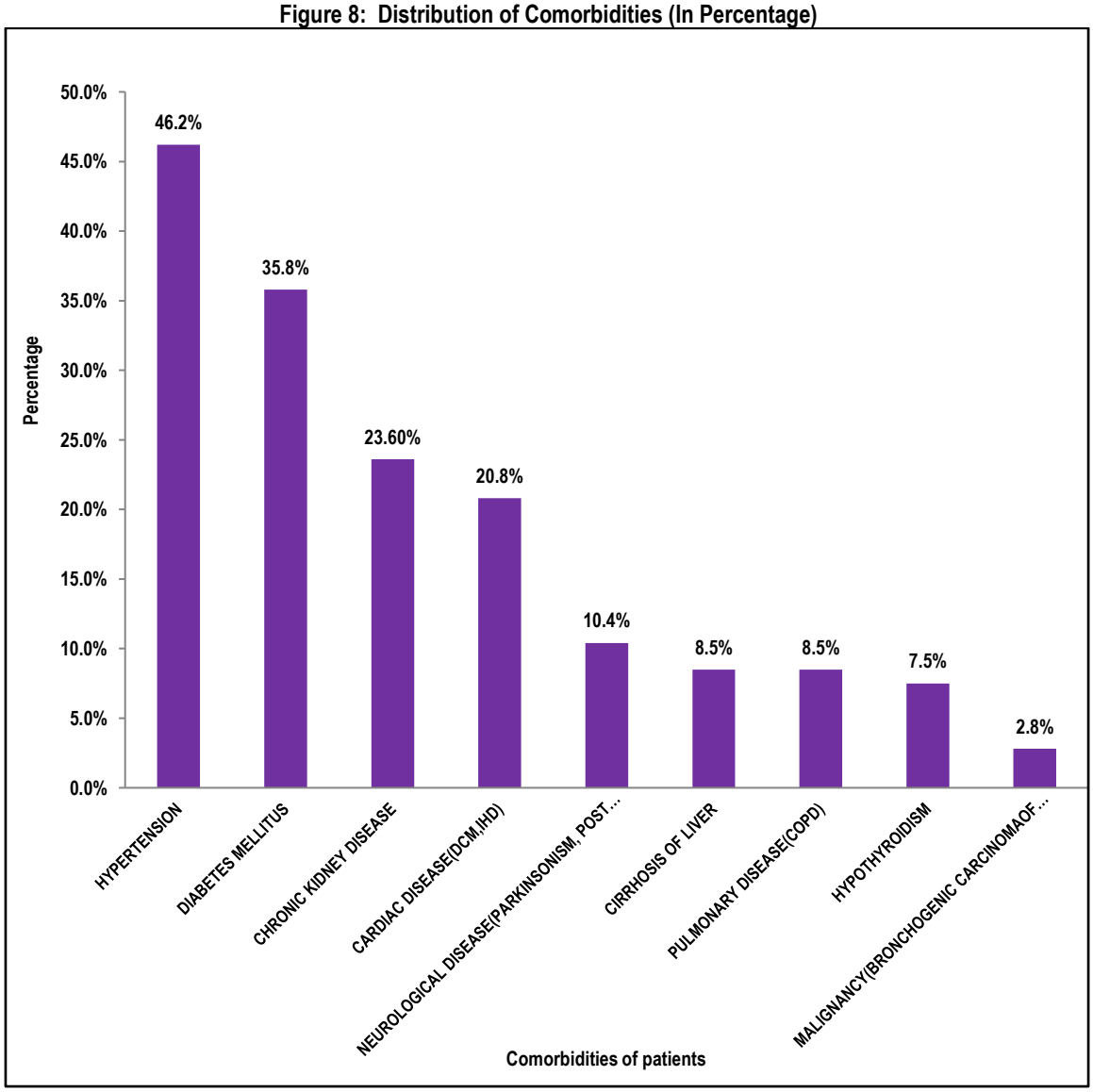


Figure 9: Outcomes of Hyponatremia in Different Serum Sodium Levels

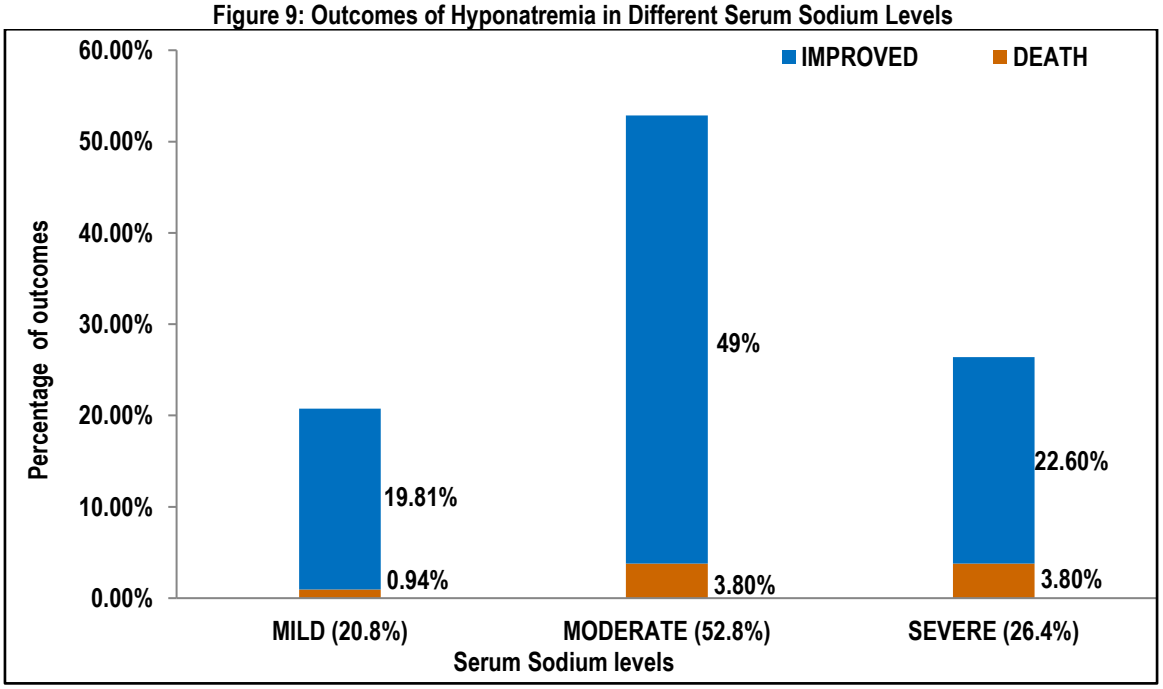
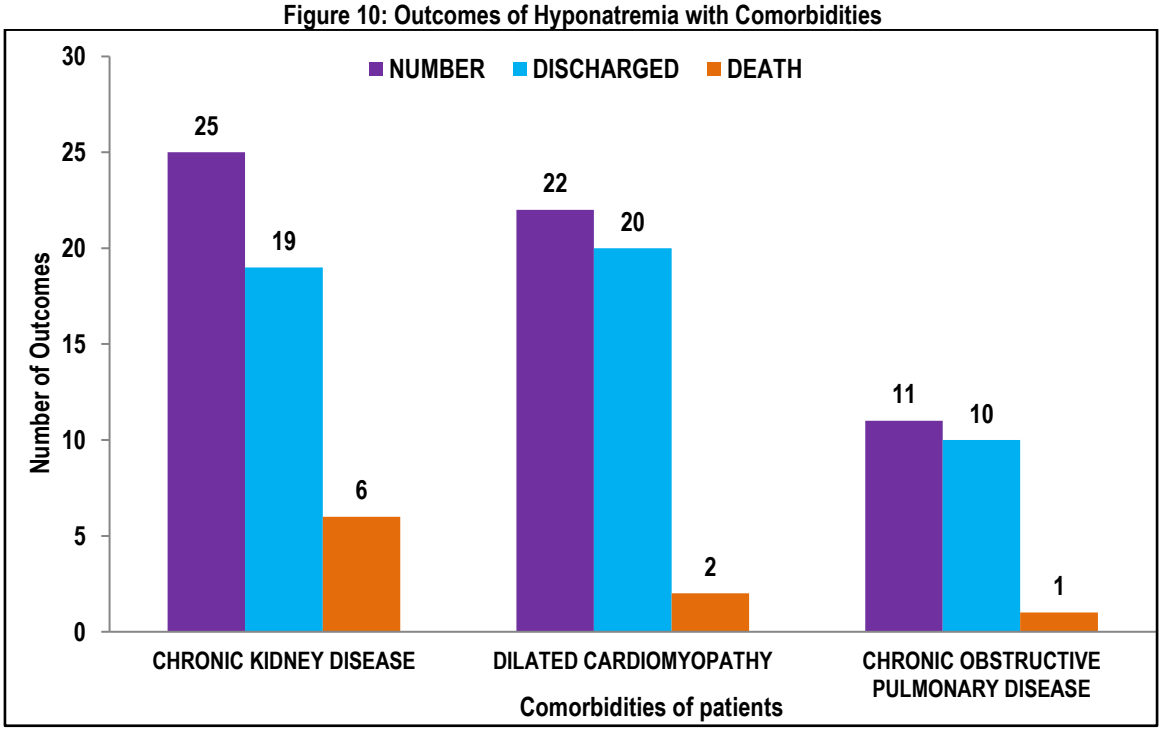


Figure 10: Outcomes of Hyponatremia with Comorbidities



DISCUSSION

In this study, prevalence of hyponatremia was found to be almost similar in both males and females with a slight predominance among females, with male to female ratio was 1:1.12(50 males and 56 females).

The most common presenting symptom was found to be altered sensorium (45.3%). A study done by Rathor P K et al who found in 41.6% cases.[12] However Prabhu T found altered sensorium in 19% cases.[15]

The most common etiology for hyponatremia was SIADH found in 32 cases (30.2%). Lim J K H et al also found SIADH as common etiology.[8] Other studies like Rao M Y et al also had similar observations[9] as well as study done by Rathor P K et al.[12] Infection like pneumonia was found to be common cause of SIADH in the present study seen in 37.5% cases. A study of Lim J K H et al also found pneumonia as cause of SIADH.[8] Hirshberg B et al also had similar findings[14]. This differences in the etiology of hyponatremia of the patients in the study population was probably due to variation of geographical area, social factors, life styles and food habits.

In our study majority of the patients was found to be in euvolemia status (55 cases, 51.9%). Hyponatremia is more common in the geriatric population due to comorbidities and drugs treatment. Most of the patients in our study had multiple co-morbid conditions of which hypertension and diabetes mellitus were the most common. Overall mortality was seen in 9 patients (8.5%) during hospital stay. Rao M Yet al also reported mortality in 20% cases.[9] Kayar N B et al reported in 17.6% cases respectively.[13] The

association between the outcomes and serum sodium levels was not found to be statistically significant in our study.

In the present study the mortality was not directly related to serum sodium levels but due to underlying different comorbid conditions of the patients. It was observed that the mortality in the present study was seen in patients with comorbidities associated with chronic kidney disease (6 patients, 5.7%), dilated cardiomyopathy (2 patients, 1.8%), and chronic obstructive pulmonary disease (1 patient, 1%) which was not related to serum sodium levels. The statistically significant relationship was only found between mortality and the comorbid condition like chronic kidney disease (p value=0.0396).

CONCLUSION

The mean age was 70.04 years with a standard deviation of 6.73 years. (range 60 – 90 years). The maximum number of patients were in the age group of 60-70 years. Out of 106 hyponatremic patients, Male and Female ratio was 1: 1.12. The mean serum sodium level was 124.8 mmol/L with a standard deviation of 5.8 mmol/L. Altered sensorium (48 cases, 45.3%) was the most common presenting symptom followed by lethargy (21 cases, 19.8%). The most common etiology was found to be SIADH (32 cases, 30.2%) followed by renal failure (19 cases, 18%) and intake of drugs like diuretics (18 cases, 17%). Among SIADH majority of the cases were found to be pneumonia (12 cases, 37.5%) followed by stroke (9 cases, 28.1%) and brain infections like meningitis and encephalitis (5 cases, 15.6%). In hyponatremia, majority of the cases was found to be in euvolemicstatus (55 cases, 51.9%). The overall mortality of hyponatremic patients was 8.5%. Short term outcomes of the hyponatremia based on serum sodium levels was not found to be statistically significant. However, short term outcomes in patients with comorbid condition like chronic kidney disease was found to be statistically significant (p value=0.0396). Hyponatremia is a very common dyseletrolytemia and clinical problem encountered in the elderly population and is associated with high morbidity and mortality particularly when associated with comorbidities.

LIMITATIONS

Small sample size and short duration of study.

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