

ORIGINAL RESEARCH

A study on the clinical profile of hyponatremia in elderly patients

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ABSTRACT

Introduction: Hyponatremia is defined as plasma sodium concentration <135 mEq/L. It is a very common disorder occurring in about 22% of hospitalized patients. **Materials and Methods:** A Observational study conducted in a Tertiary Hospital, Bangalore during the study period between February 2021 to March 2022. Patients aged ≥ 60 years admitted with serum sodium < 135 mEq/L were included in the study. The sample size of sixty patients were selected randomly during this period of time. **Results:** Mean age of subjects in the study was 70.67 ± 8.2 years. Majority of subjects in the study were in the age group 60 to 65 years (33.3%), followed by 66 to 70 years (23.3%) and least number of subjects were in the age group > 80 years. **Discussion:** This study was undertaken keeping in view of frequent occurrence of hyponatremia in the elderly sick patients who are at higher risk of development of electrolyte disturbance as these people have age related physiological changes in the function of kidneys and other multiple co-morbid conditions. **Conclusion:** Hyponatremia is a common electrolyte abnormality found in hospitalized patients. It is more common in elderly patients.

Key words: Hyponatremia, electrolyte

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INTRODUCTION

Hyponatremia is defined as plasma sodium concentration <135 mEq/L. It is a very common disorder occurring in about 22% of hospitalized patients. It can be classified on the basis of serum osmolality into hypertonic, isotonic and hypotonic type. Hypotonic hyponatremia is further classified into hypervolemic, euvolemic and hypovolemic.

Mild hyponatraemia is generally asymptomatic, but where the decrease in serum sodium is marked (≤ 125 mmol/l) or acute (occurring over < 48 h), serious neurological complications can occur as a result of cerebral oedema. Early symptoms of headache, muscular weakness, nausea, lethargy, ataxia and confusion can progress to seizures, irreversible neurological damage, coma and death, if unrecognized and untreated. In chronic hyponatraemia, cerebral wasting of intracellular potassium followed by organic osmolytes reduces cerebral swelling, delaying the onset of symptoms. The correction of hyponatraemia should be carefully managed, because of its association with the osmotic

demyelination syndrome (central pontine myelinolysis). Patients with chronic hyponatraemia appear to be particularly vulnerable to this complication. Severe hyponatraemia has a high mortality. In order to give correct treatment, an accurate clinical assessment must be made, focusing on fluid status, chronicity and potential aetiology, along with appropriate investigations. Hyponatremia is common among hospitalized patients and can lead to serious complications, but its assessment is challenging and strategies for its management have traditionally been suboptimal. New therapies are emerging that promise a more targeted approach to regulating body water and sodium balance in patients with this disorder.

AIMS & OBJECTIVES

1. To study the clinical features of hyponatremia in elderly hospitalized patients.
2. To study the etiology, management and outcome of hyponatremia in elderly hospitalized patients.

3. To assess the Morbidity and Mortality due to hyponatremia.

MATERIALS AND METHODS

SOURCE OF DATA

A Hospital-based Observational study conducted in a Tertiary Hospital, Bangalore during the study period between February 2021 to March 2022. Patients aged ≥ 60 years admitted with serum sodium < 135 mEq/ L were included in the study. The sample size of sixty patients were selected randomly during this period of time.

INCLUSION CRITERIA

- Patients aged ≥ 60 years with serum sodium < 135 mEq/ L (Government of India defines ‘ senior citizen’ or ‘Elderly’ as a person who is of age 60 years or above) ⁶⁴

EXCLUSION CRITERIA

- Patients aged < 60 years.
- Serum sodium ≥ 135 mEq/L.

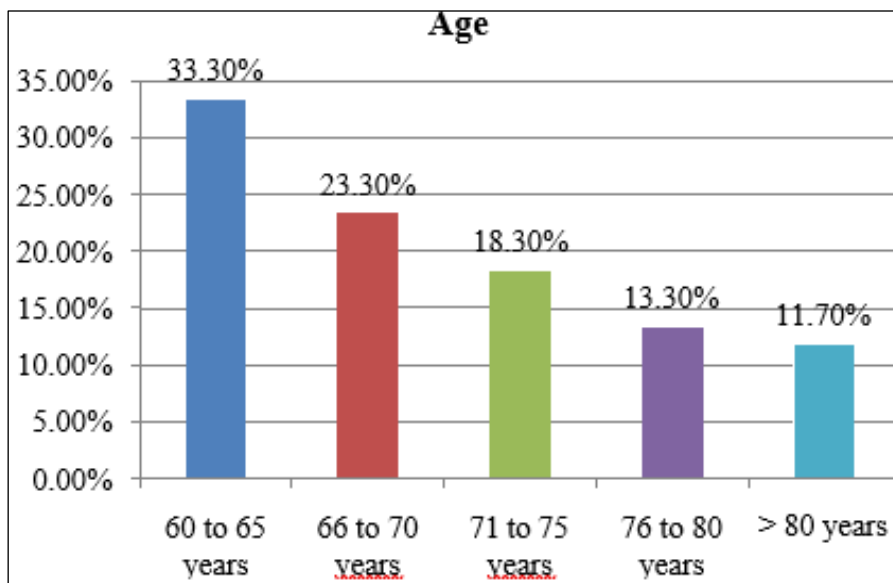
RESULTS

Table 1: Age distribution of subjects with hyponatremia

		Count	%
Age	60 to 65 years	20	33.3%
	66 to 70 years	14	23.3%
	71 to 75 years	11	18.3%
	76 to 80 years	8	13.3%
	> 80 years	7	11.7%
	Total	60	100.0%

Mean age of subjects in the study was 70. 67 ± 8. 2 years.

Majority of subjects in the study were in the age group 60 to 65 years (33. 3%), followed by 66 to 70 years (23.3%) and least number of subjects were in the age group > 80 years.

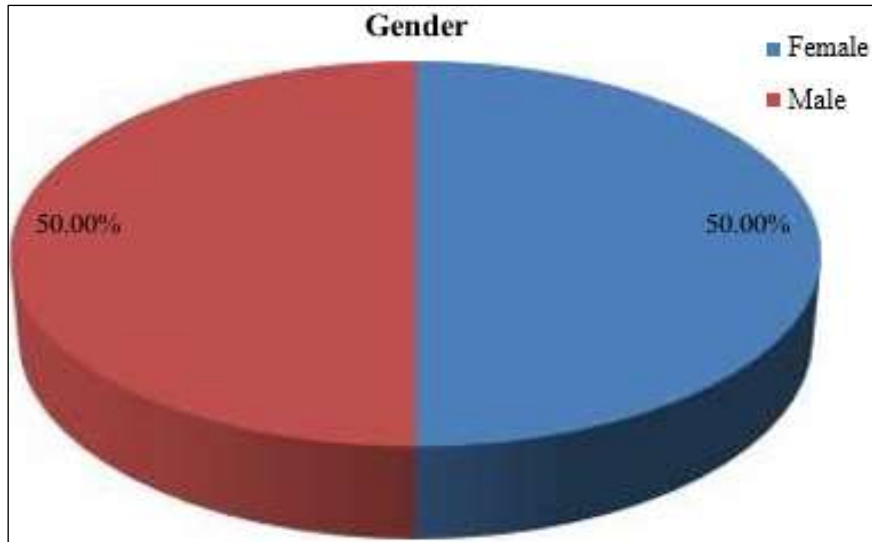


Graph 1: Bar diagram showing Age distribution of subjects with hyponatremia

Table 2: Gender distribution of subjects

		Count	%
Gender	Female	30	50.0%
	Male	30	50.0%
	Total	60	100.0%

Gender distribution in the study was equal. Males and female were 50% respectively.



Graph 2: Pie diagram showing Gender distribution of subjects

DISCUSSION

This study was undertaken keeping in view of frequent occurrence of hyponatremia in the elderly sick patients who are at higher risk of development of

electrolyte disturbance as these people have age related physiological changes in the function of kidneys and other multiple co-morbid conditions.

Age and gender distribution

Study	Gender		Mean age
	Male	Female	
In Present Study	50%	50%	70.67 ± 8. 2 years
Thomas Vurghese et al ⁶⁶ (2006)	56.1%	43.9%	57.05±2.0
Rubio et al ⁵¹ (2012)	47.3%	52.7%	83.6±7. 9
Rao et al ⁵⁰ (2010)	55%	45%	71.96±9.6

In the present study 60 elderly patients (≥ 60 years) were included. Out of 60, 50% (30) were males and 50% (30) were females respectively.

In study done by Rao *et al.* ⁵⁰. 55 were females and 45 were male. In study by Mahavir *et al.* ³⁹. 64.3% were males and 53.7% were females. In study by Rubio *et al.* ⁵¹. 52.7% were females and 47.3% were males. In study by Vurghese *et al.* ⁶⁶. Males were 56.1%, females 43.9%. In study by Rubio *et al.* ⁵¹. Mean age was 83. 6.

In the present study majority were in the age group 60 to 65 years (33.3%), followed by 66 to 70 years (23. 3%) and least number of subjects were in the age group > 80 years. Mean age of subjects in the study was 70.67 ± 8.2 years.

In the present study the majority of the cases were asymptomatic at the time of presentation, 55% out of symptomatic cases, 45% had lethargy, 31.7% had abnormal behaviour, 6.7% had postural dizziness and

5% (2 cases) had seizures. Both the patients had GTCS, had recovered when serum sodium normalized. None of the patients were in coma. Most common presentation in the study was Lethargy in 45%, followed by abnormal behaviour in 31.7%.

In study Rao *et al.* ⁵⁰., lethargy, drowsiness with slow response and irrelevant talk were the common presenting symptoms. 4% had seizures.

In study by Mahavir *et al.* ⁴⁰. Confusion was present in 30% and altered sensorium in 17.1%. 2% had seizures. 14% were asymptomatic.

In the present study out of 55. 0% asymptomatic patients, 20% had mild, 13.3% had moderate and 66. 7% had severe hyponatremia. All the symptomatic patients were having severe hyponatremia. This could not be compared with other studies because the range of hyponatremia of mild, moderate and severe is different in this study.

Mean plasma sodium level

Study	Mean plasma sodium level
In present study	119. 6mEq/ L
Thomas Vurghese et al ⁶⁶ (2006)	122m Eq/ L
Rubio Rivas H et al ⁵¹ (2012)	137. 3mEq/ L
Prabhu T et al ⁴⁸ (2014)	127. 4mEq/ L

SUMMARY

- Hyponatremia is the most common electrolyte disorder in hospitalized patients particularly in elderly. Hyponatremia is important to recognize because of the potential morbidity, mortality and the economic impact on the patient and health care.
- Studying the risk factors, etiology and management of hyponatremia in hospitalized patients will help in reducing its incidence and minimizing the complications associated with hyponatremia.
- The study was conducted in Tertiary Hospital, Bangalore Successive patients of hyponatremia were included in the study.
- These patients were evaluated for the underlying cause of hyponatremia which included detailed history and physical examination followed by appropriate labor story investigations based on serum osmolality.
- Sixty patients were included in the study out of 55.0% were asymptomatic at the time of presentation. Out of symptomatic cases, 45% had lethargy, 31.7% had abnormal behaviour, 6.7% had postural dizziness. 5.0% had seizures. There was wide range of etiologies, Most common being CCF (75.0%), Poor Oral Intake (37.5%), SIADH (27.5%), Vomiting (12.0 %).
- In the study NS was given to 6 patients, 3% saline given for 33 patients with severe hyponatremia. Higher proportion of diuretic and fluid restriction was used in Mild Hyponatremia. Tolvaptan was used in 14 patients with Severe hyponatremia (of them 12 patients had SIADH and 2 patients had CCF), 5 patients were given Potassium restriction in severe hyponatremia.
- Significant difference in treatment received was observed with respect to 3% saline, diuretic use, fluid restriction and Tolvaptan.
- CCF, Poor oral Intake, SIADH was associated in a large proportion of the patients in this study which has been considered as etiology of hyponatremia in available literature. Treatment with hypertonic saline is safe provided gradual correction of hyponatremia is followed in this study. Osmotic demyelination syndrome is a rare complication related to the treatment of hyponatremia and should be suspected in a case of hyponatremia who develop fresh neurological deficits while on treatment or after treatment with hypertonic saline.
- Hyponatremia is a common problem in hospitalized patients. The possible cause of hyponatremia should always be determined, as outcome in severe hyponatremia is governed by etiology and not by serum sodium level. The correction of hyponatremia also helps to improve the prognosis of the underlying disease and helps to prevent further complications due to the hyponatremia itself.

CONCLUSION

- Hyponatremia is a common electrolyte abnormality found in hospitalized patients. It is more common in elderly patients.
- Hypertension, Diabetes, CCF, CKD, CLD as pre-existing co-morbidity was present in majority of patients and it predisposed the patients to hyponatremia.
- Lethargy was the most common symptom. Other common symptoms were abnormal behaviour and postural dizziness. All the symptomatic cases had severe hyponatremia.
- Most common form of hyponatremia was hypervolemic hypo-osmolar hyponatremia.
- Most common etiology was CCF. Other major causes were SIADH, poor oral intake, vomiting. Hyponatremia was found to be related to multiple etiological factors in a large number of patients.
- Treatment of hyponatremia with hypertonic saline should be restricted to patients who are symptomatic. Treatment with hypertonic saline is safe provided gradual correction of hyponatremia is followed.
- Osmotic demyelination Syndrome is a rare complication related to the treatment of hyponatremia and should be suspected in a case of hyponatremia who develop fresh neurological deficits while on treatment or after treatment with hypertonic saline.
- A systematic approach to the diagnosis of hyponatremia with the application of simple diagnostic algorithms, history taking, clinical examination and laboratory findings to establish mechanism of hyponatremia can significantly improve the management and outcome of hyponatremia.

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