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Clinical Profile of Hyponatremic Elderly Patients

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ABSTRACT

Background

Hyponatremia is defined as sodium less than 135mEq/l. It is a clinico etiological study on hyponatremic elderly patients presenting to emergency department.

Aim and objective

All patients aged 60years and above with their serum sodium level less than 135mEq/L were included in the study.

Methods

A total of 100 patients were included in the study. It is a prospective observational study conducted from 2016 to 2018 in a tertiary care hospital.

Results

We had more of male patients compared to female, more during their sixth and seventh decade. with a mean age of 66.63 years. more of neurological symptoms like altered sensorium, drowsiness and seizures. Majority of the patients are with mild hyponatremia (52%) followed by severe grade (25%) and 23% of them had moderate hyponatremia. And mean serum sodium 124.56mEq/. Patients with mild and moderate hyponatremia most of their presenting symptoms were non-neurological, whereas patients with severe hyponatremia majority of them presented with neurological symptoms. Hypertension followed by diabetes mellitus was the most common pre-existing illness present among the patients. Among the various aetiologies reported among our study subjects the most common aetiology was found to be SIADH that is euvolemic hyponatremia was found to be common in present study. The second most common cause was drug induced Like diuretics.

Conclusion

As the p value >0.05 so patients had more than one factor influencing the occurrence of hyponatremia. Mortality in our study was around 4.30% which was significantly low. The mortality is mainly due to an underlying primary disease. length of stay increased with the severity of disease.

Keywords: Hyponatremia, Sodium, Neurological symptoms.

Original Research Article**INTRODUCTION**

Hyponatremia is defined as a serum sodium concentration (Na⁺) less than 135 mEq. Serum sodium levels and serum osmolality are normally maintained under precise control by homeostatic mechanisms involving thirst, anti-diuretic hormone (ADH) and renal handling of filtered sodium. Patients who are having serum sodium concentration is greater than 130 mEq/L are most of the time asymptomatic, whereas those in whom these values are lower may have symptoms. Clinically symptoms are different from individual to individual. Majority of patients with hyponatremia are asymptomatic.^[1] It is well known that there are eight physiologic changes that occurred in the elderly such as reduced total body water volume, reduced glomerular filtration rate, reduced urinary concentrating ability, increased ADH (antidiuretic hormone) concentration, increased ANP (atrial natriuretic peptide) concentration, declined aldosterone concentration, reduced sensitivity of the thirst, and reduced free water clearance which make this group easy to be hyponatremic. It can be classified on the basis of serum osmolality into hypertonic, hypotonic and isotonic type. Hypotonic hyponatremia is further classified into hypervolemic, euvolemic and hypovolemic.^[2]

AIM**Primary objective**

- To study the clinical feature and etiology of hyponatremia in elderly patients.
- To study effects of various factors and comorbidity on the outcome of hyponatremia.

Secondary objective

- To study the mortality,
- To study the length of hospital stay because of hyponatremia in elderly patient

MATERIALS & METHODS

The present Prospective observational study was conducted on 100 elderly patients age >60 yrs. with Na levels <135meq/l (reference group) presenting emergency department of Yashoda Hospital, Secunderabad from November 2016 to September 2018.

Sample size has been calculated using the- **Kish Leslie formula**

$$Z^2 \times p (1 - p) / d^2$$

Where,

Z=standard normal variable of the confidence interval (1.96 confidence level 95%)

p=prevalence of hyponatremia.

(Based on previous data)=23% (Based on previous studies.) d =precision (level of error) = 0.1

Using this formula, the required sample size calculated.

Original Research Article**Inclusion criteria**

1. Subjects aged >60 years
2. Patients with serum sodium <135 meq/l

Exclusion criteria

1. Age less than 60 years.
2. Subjects with severe renal dysfunction and on dialysis.
3. Subjects with MODS.
4. Patients who received mannitol before presentation.
5. Postoperative patients.

Methodology

This is a prospective observational study conducted among 100 patients from November 2016 to 2018, selected patients were more than 60 years with a sodium level <135mEq selected according to inclusion and exclusion criteria. Ethical committee clearance was taken. hyponatremia is divided into mild (135mEq _130mEq), moderate (129mEq-121mEq), severe less than 120mEq. MS office 2013 SPSS version 20 was used for most analysis.

Results

Among 100 patients 55 patients were male, 45 patients were female with a ratio 1.22:1. symptomatic were 55, asymptomatic were 45, in the study Chaterjee et al^[3] 62% male, 38% female which correlates with our study. Mean Na⁺ in our study 126.34mEq. mean age in our study 66.41±SD 6.66. more number of cases were in the age 65 to 69 comparable with the study Shanumugasundaramrajamani et al.^[4] The various factors responsible for hyponatremia in elderly are decreased glomerular filtration rate, impaired ability of kidney to conserve sodium increased release of arginine vasopress into a given osmotic stimulus, various drugs taken by them, decreased appetite. In our study 55 patients were symptomatic more of neurological symptoms like nausea, vomiting, headache (31%) altered sensorium (29%), seizure 15%, drowsiness 20%, coma 3%. Our observation correlates with the study Kanchana S Pilla et al.^[5]

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	Range	No. of patients
Mild	135-130	52
Moderate	129-121	23
Severe	<120	25

Table1. severity of the disease

some patients with severe <120mEq had neurological symptoms like drowsiness but patient with serum sodium <110mEq showed severe neurological symptoms like seizures, our observation correlates with V Padma, Syedjavid et al^[6]. Mean sodium for symptomatic patients 124.56mEq. Hydration status of patients were divided into hypervolemic, euvolemic, hypovolemic.

Volumestatus	Symptomatic	Asymptomatic
Hypervolemic	8	11
Hypovolemic	10	22

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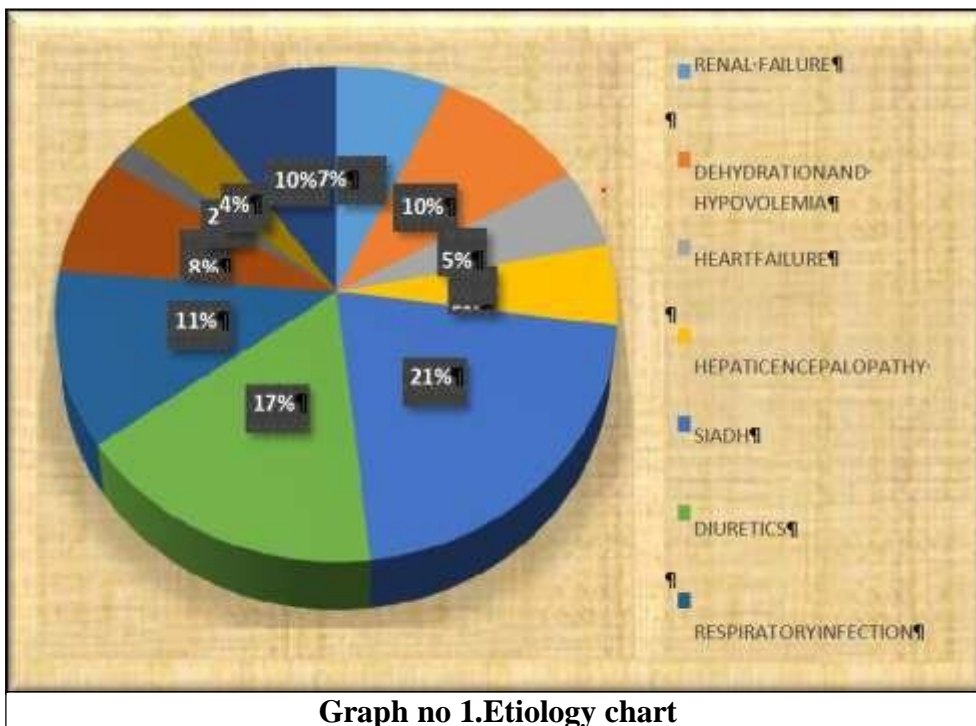
Euvolemic	37	11
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Table 2. hyponatremia with volume status

49% euvolemic, 19% hypervolemic, 32% hypovolemic which correlates with study Chatterjee et al and V Padma, Syedjavid study et al. In our study 37 % hypertension, 34% copd, 4% hypothyroid, 5% renal disorder, 5% cardiac failure. hypertension and diabetes are most common co morbidity among the population

Co morbidity	Number of patients	Percentage
Hypertension	59	37%
Diabetes	54	34%
Copd	6	4%
Hypothyroidism	9	5%
Renal	8	5%
Cardiacfailure	24	15%

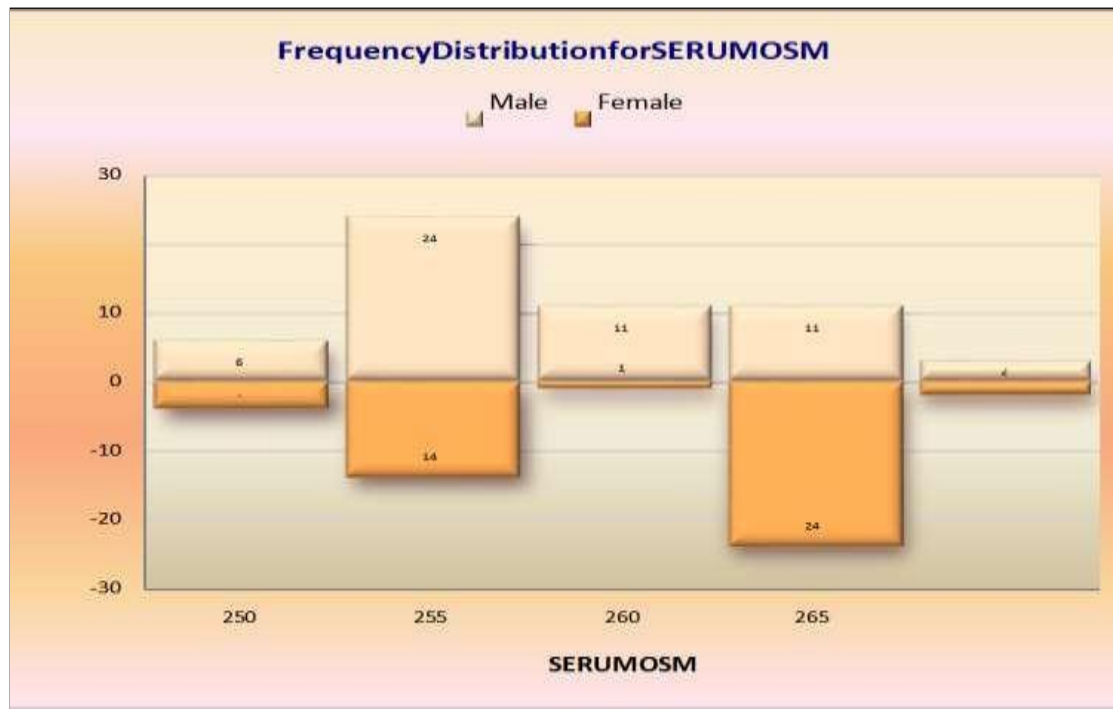
Table 3.Co morbidity



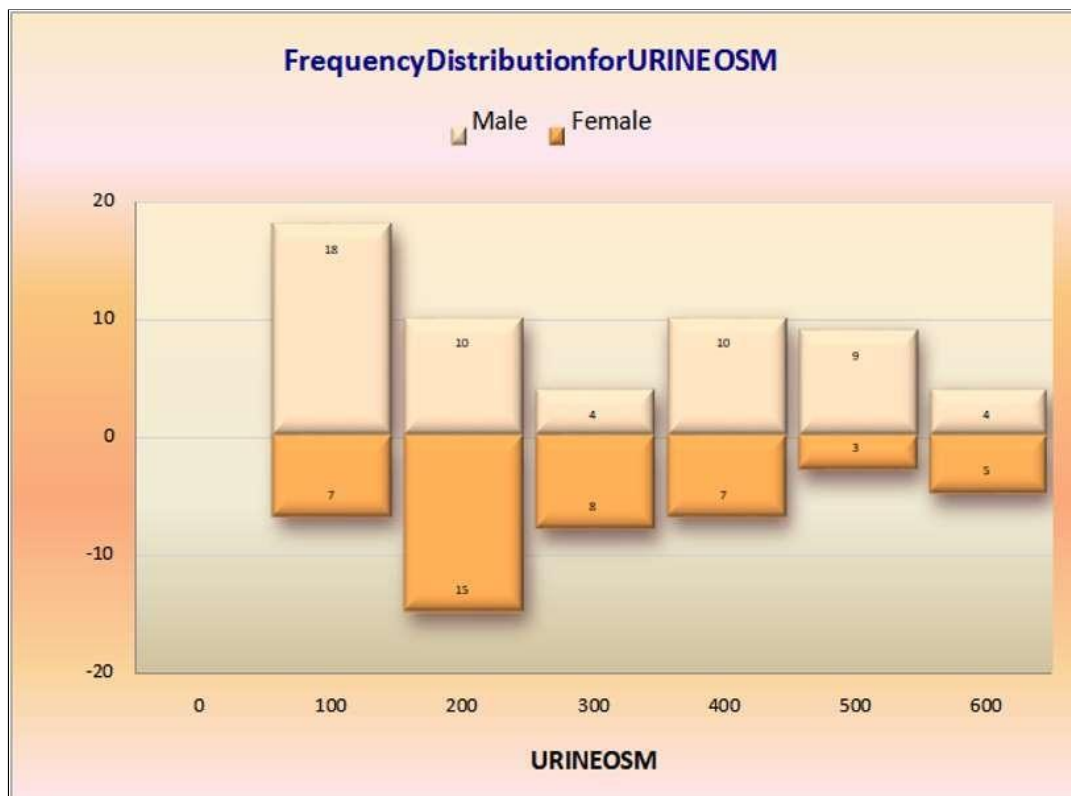
Graph no 1.Etiology chart

SIADH is most common cause for hyponatremia followed by drug induced hyponatremia.in Shanmugasundaram et al^[4] most common cause found to be drug induced. in our study it was shown that there was no stastical significant association between any etiological factor and severity of hyponatremia (p>0.05). Mean

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Graph no 2. Frequency distribution for serum osmolarity



Graph 3. Frequency distribution of urine osmolarity

urine Sodium 36.54 ± 2.045 mEq, urine osmolarity 282.45 ± 23.65 mosm/.

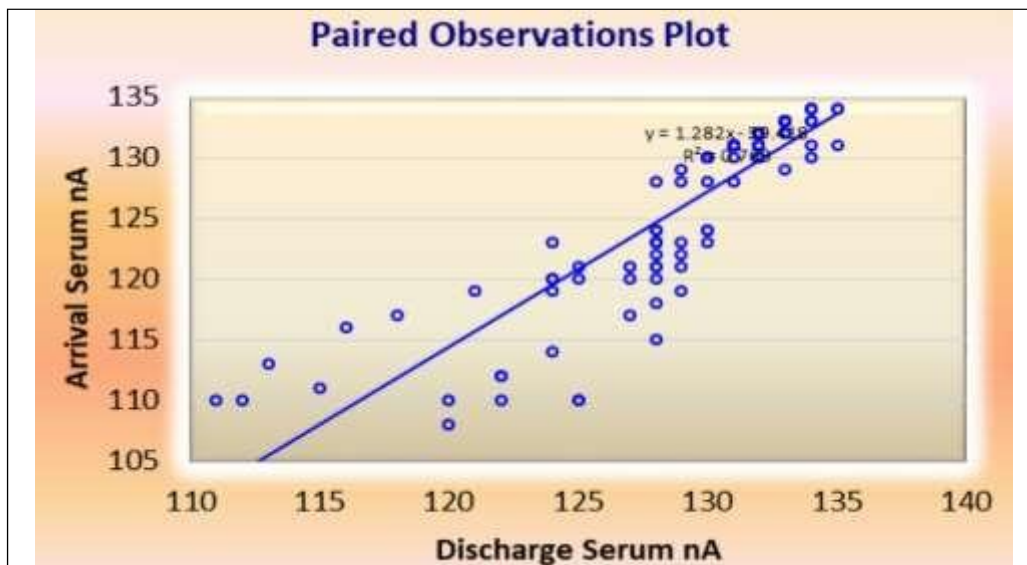
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Treatment and monitoring; monitoring done on 6th hourly, 12th hourly. Patients received treatment according to their symptoms like 3% normal saline, normal saline, fluid restriction, steroid alone or in combination.

Treatment	No. of patients	Percent
3%NACL	25	25%
ISOTONICSALINE	17	17%
DIURETICS	8	8%
OPTIMISE DRUGS CAUSING HYPONATREMIA	10	10%
STEROIDS	2	2%
3% NACL+STEROIDS	4	4%
3% NACL+FLUID RESTRICTION	7	7%
3%NACL+ISOTONIC SALINE	3	3%
FLUID RESTRICTION	7	7%

Table 4: Treatment for hyponatremia

Mortality in our study is 4.30%. length of stay 5 patients 0-4days were in mild category, 42 patients mild to moderate 5 to 9 days, 46 patients for 10-15 days were in moderate category and more than 15 days were 7 patients with severe category even gilovanni corona et al^[7] who has done systematic study on economic burden of hyponatremia which says length of stay increases with severity.



Graph 4. Serum sodium value on arrival and at the time of discharge.

	Discharge SerumX1-nA	Arrival SerumnAX2		
Mean	128.780	125.680	3.100	
Std. Error	0.510	0.749	0.392	
Std. Deviation	5.102	7.489	3.920	
TTest	7.909	Prob	0.000	****

Outcome; mortality was highest with severe disease. Among 100 patients 93 patients improved. 4 died.

Original Research Article**DISCUSSION**

Among 100 patients 55 patients were male, 45 patients were female with a ratio 1.22:1. Symptomatic were 55, asymptomatic were 45, in the study Chaterjee et al^[3] 62% male, 38% female which correlates with our study. Mean Na⁺ in our study 126.34mEq. mean age in our study 66.41±SD 6.66. More number of cases were in the age 65 to 69 comparable with the study Shanmugasundaramrajamani et al^[4]. The various factors responsible for hyponatremia in elderly are decreased glomerular filtration rate, Impaired ability of kidney to conserve sodium increased release of arginine vasopressin to a given osmotic stimulus, various drugs taken by them, decreased appetite. In our study 55 patients were symptomatic more of neurological symptoms like nausea, vomiting, headache (31%) altered sensorium (29%), seizure 15%, drowsiness 20%, coma 3%. Our observation correlates with the study kanchana s pillai et al.^[5]

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CONCLUSION

Symptomatic hyponatremia is common among the elderly hyponatremic patients. Neurological symptoms are common in hyponatremic patients in elderly. Majority of patients presented were in the sixth and seventh decade. SIADH and Euvolemic hyponatremia formed the largest group in the study. Drugs, especially diuretics, are common cause of hyponatremia. The mortality is mainly due to an underlying primary diseases. Symptoms of hyponatremia increased with severity of hyponatremia. Length of stay increases with severity of disease. As the p value >0.05 so more than one factor influencing the occurrence of hyponatremia.

LIMITATION OF THE STUDY

Study has its own limitation as the sample size is less and it is single centred study.

CONFLICT OF INTEREST: NIL.

FUNDING: NIL.

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