



## A Study on Clinical Profile of Severe/ Symptomatic Hyponatremia in Elderly Patients

Authors

**Dr Arathi N<sup>1</sup>, Dr Jayachandran R<sup>2</sup>, Dr Suresh Raghavan<sup>3</sup>**

<sup>1</sup>Lecturer in Medicine, Government TD Medical College, Alappuzha

<sup>2</sup>Assistant Professor, Department of Medicine, Government TD Medical College, Alappuzha

<sup>3</sup>Professor, Department of Medicine, Government TD Medical College, Alappuzha

Corresponding Author

**Dr Jayachandran R**

Assistant Professor of Medicine, Government TD Medical College, Vandanam PO, Alappuzha 688005

Email: [drjcci@gmail.com](mailto:drjcci@gmail.com)

### Abstract

**Background:** Hyponatremia is an important and common electrolyte abnormality that can be seen in isolation or as a complication of other medical illness. Sodium homeostasis is vital for the normal physiological function of the cells. Severe hyponatremia defined as serum sodium  $<115\text{mEq/L}$  is associated with significant morbidity and mortality. Hyponatremia has been found to be a predictor of worsened outcomes in a variety of diseases including myocardial infarction, congestive cardiac failure, cirrhosis. This is probably because hyponatremia is more an indicator of severity of many underlying diseases, than an independent contributor to mortality.

**Objectives:** The present study aims in portraying the clinical profile of severe hyponatremia in patients above 65 years of age, getting admitted in the medical ward over a period of 1 year.

**Materials and Methods:** All patients who satisfied the inclusion criteria were included in the study. A detailed history, including drug history was taken. A thorough physical examination was carried out with special reference to volume status assessment. Blood samples were sent for assessment of complete hemogram, blood sugar, renal function tests, liver function tests, serum electrolytes and uric acid levels in all patients. If indicated, serum cortisol and thyroid function tests were done. Urine spot sodium and urine osmolarity were also done in all patients. Patients were subjected to special investigations like, CT head, Lumbar Puncture, Ultrasound abdomen if required. Patients were studied after categorizing them according to the duration of hyponatremia as well as the volume status. Patients were treated according to their volume status and the underlying illness. They were monitored during their course of hospital stay for determining the outcome.

**Observations:** There were a total of 60 cases during the 1 year period who satisfied the inclusion criteria. 25 % were above 75 years of age. 60% of the cases were females. 80% of the cases were acute hyponatremia. 98% of patients had altered sensorium as the presenting complaint. Seizure in 37% and head ache in 35%. 48% cases were hypervolemic on admission. 8% of cases expired during the hospital admission.

**Conclusions:** Hyponatremia is a very common problem in clinical practice. Females are more commonly affected than males. Lower baseline sodium has a higher incidence of producing more neurologic complications. The older the patient is the lesser will be the efficacy of the salt conserving machinery.

## Introduction

The normal serum sodium level is 136-145 mEq/L<sup>1</sup>. When hyponatremia is defined as serum sodium level <136 mEq/L, incidence of hyponatremia is as high as 15-30%, in both acutely<sup>2,3</sup> and chronically hospitalized patients<sup>4,5</sup>. However the incidence decreases to 1-4% when serum sodium levels <130 mEq/L are considered<sup>3,6,7</sup>. Therefore although hypoosmolarity and hyponatremia are relatively common, most cases are relatively mild and manifest during the course of hospitalization.

Severe hyponatremia is defined as serum sodium <115mEq/L. even mild hyponatremia can quickly progress to more dangerous levels during the course of management of other disorders<sup>8</sup>. Overtly rapid correction of hyponatremia itself can cause neurological morbidity and mortality<sup>8,9</sup>. It has been observed that mortality rates are higher from 3 fold to 60 fold in patients with even asymptomatic hyponatremia compared to normonatremic patients<sup>7,10</sup>.

Remarkably hyponatremia has been found to represent an independent predictor of worsened outcomes in a variety of diseases including myocardial infarction, congestive cardiac failure cirrhosis<sup>11,12,13,14</sup>. This is probably because hyponatremia is more an indicator of the severity of many underlying illness than it is an independent contributor to mortality. These considerations emphasise the importance of careful evaluation of all hyponatremic patients regardless of the clinical settings in which they are present.

## Aims and Objectives of the Study

The aim of this study is to understand the clinical profile of patients above 65 years with hyponatremia.

## Materials and Methods

All individuals above 65 years of age of both the sexes admitted in a tertiary care with severe symptomatic hyponatremia, irrespective of the

cause over a period of 1 year were included in the study.

All patients were evaluated by a detailed history including drug intake if any. They were examined in detail, especially the volume status. According to the volume status of the patients, they were classified into euvolemic, hypovolemic (tachycardia, postural fall in blood pressure and absence of skin turgor) and hypervolemic (edema and raised JVP). They are also classified as acute (<48 hours) and chronic (>48 hours) hyponatremia based on the duration of symptoms.

The patients were subjected to routine investigations like, complete hemogram, random blood sugar, renal function tests, liver function tests, serum electrolytes and serum uric acid. Pseudohyponatremia was excluded after implementing correction factor for hyperglycemia and hyperlipidemia.

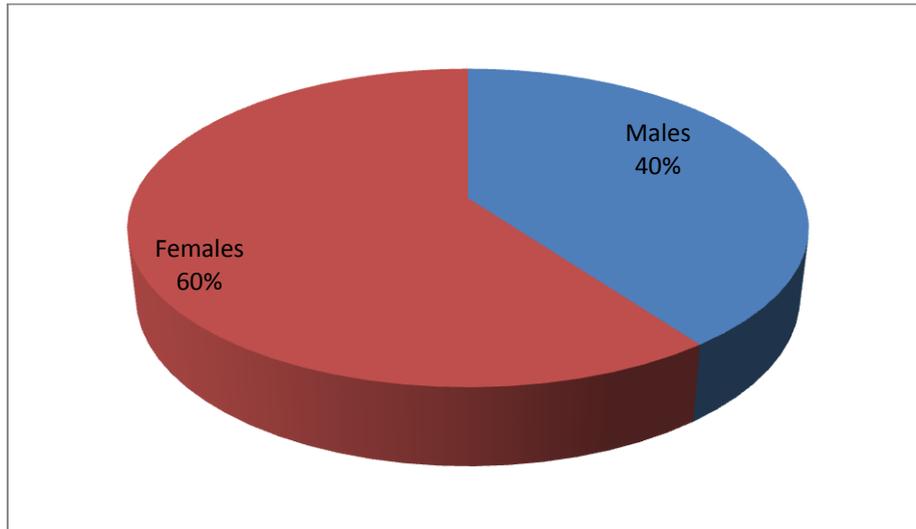
Urine sample was collected for spot sodium and urine osmolarity. They were also subjected to chest radiography and electrocardiogram as a part of routine evaluation.

If indicated as per the clinical examination and base line investigations, the patients were subjected to additional investigations like, ultrasound abdomen, CT Scan, Lumbar puncture, Thyroid function tests and serum cortisol.

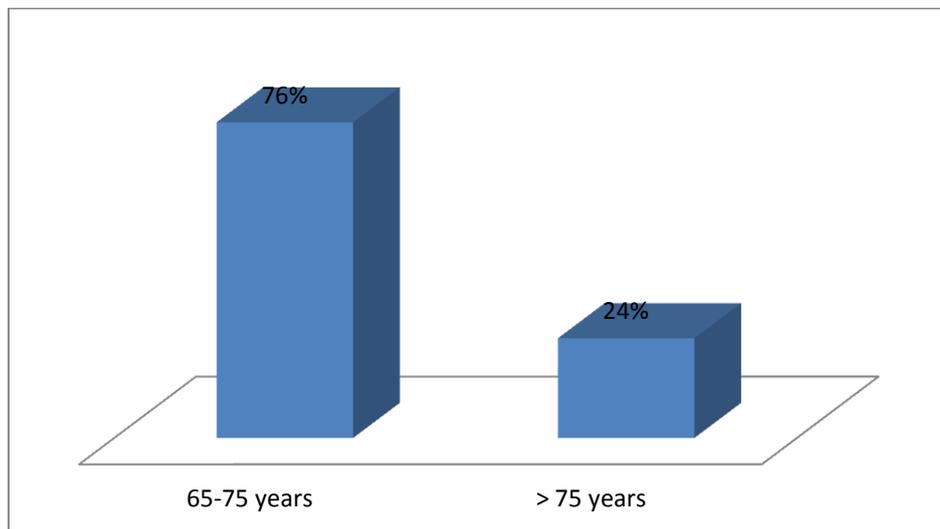
Patients are given treatment according to the mode of presentation, volume status and the serum sodium levels as per the established guidelines and recommendations. Definitive management of underlying illness are given concurrently, at the same time avoiding those treatment modalities that may exacerbate the hyponatremic status. Patients are monitored during their stay in hospital to note their outcome.

**Observation**

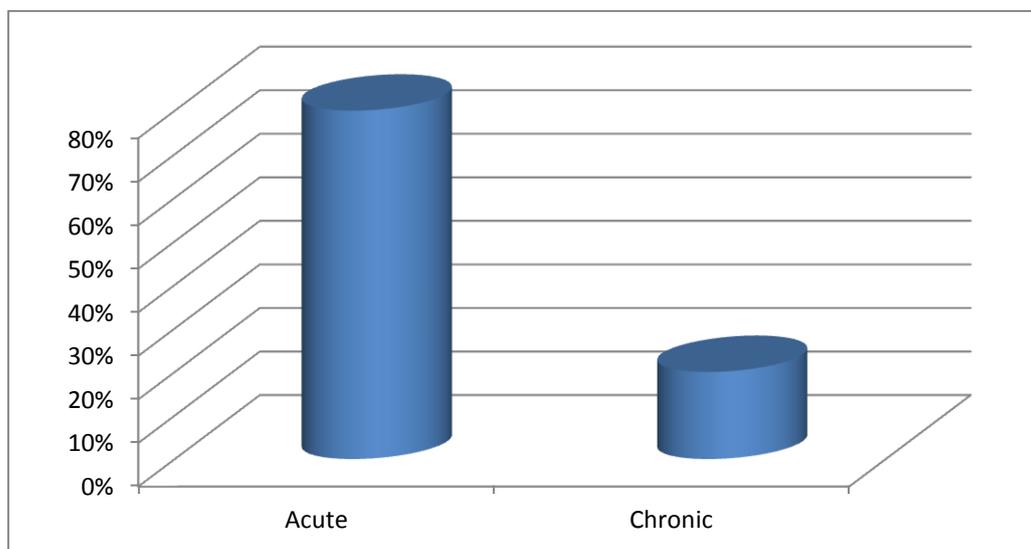
We had a total of 60 patients who had satisfied the inclusion criteria



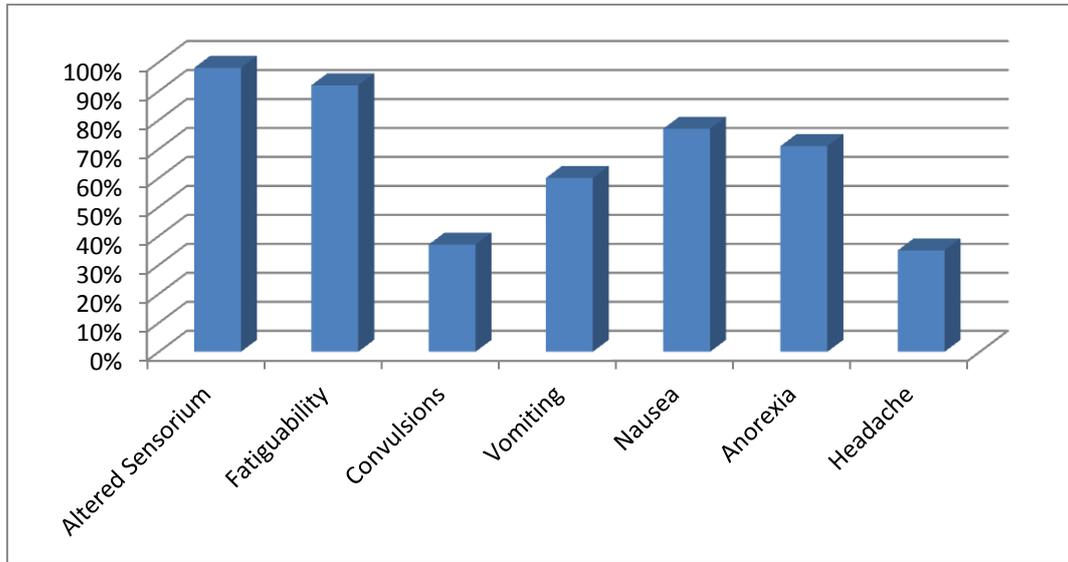
**Figure 1: Sex Distribution of patients**



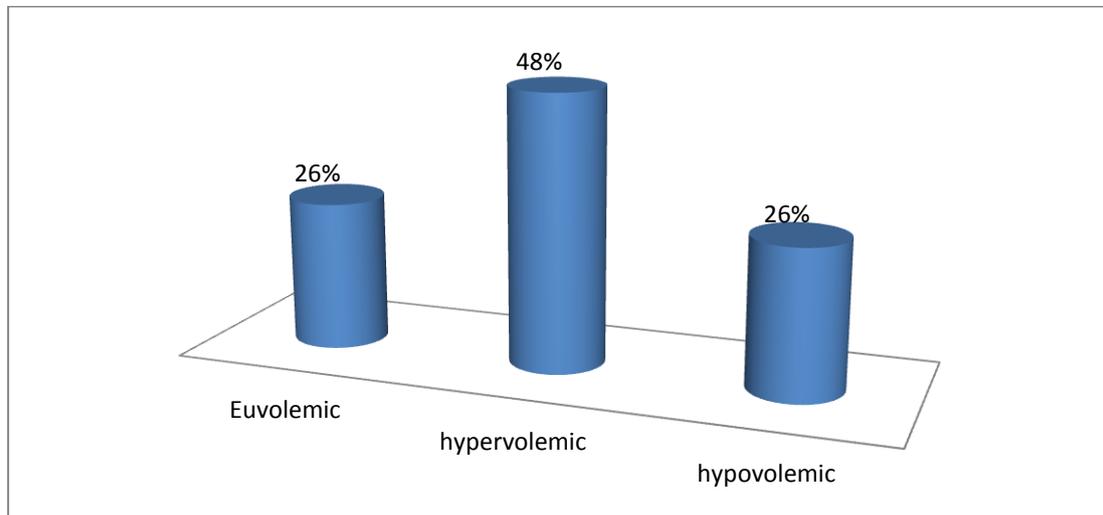
**Figure 2: Age distribution of cases**



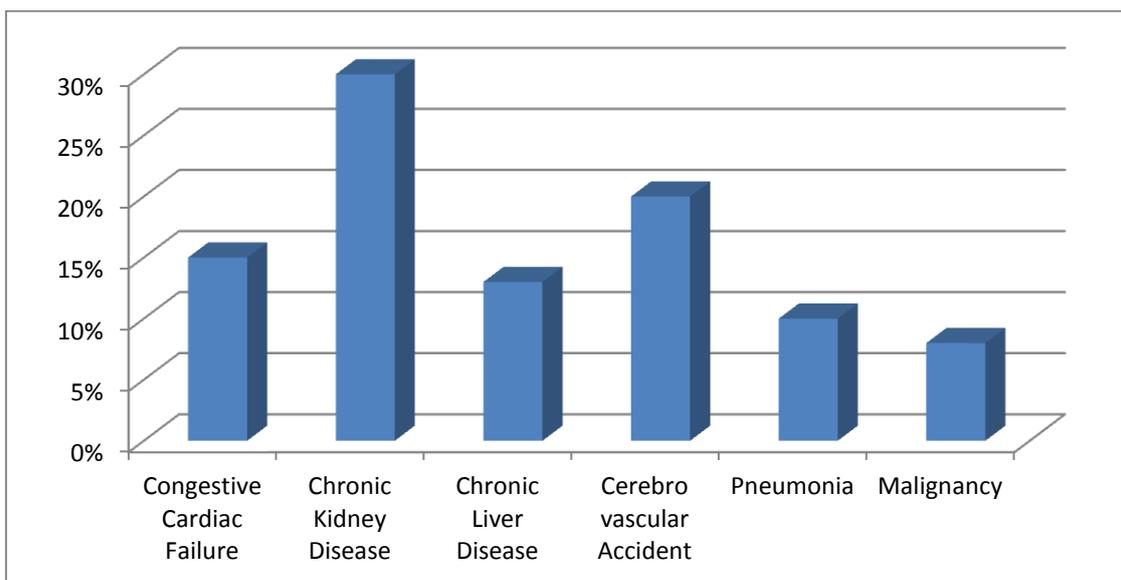
**Figure 3: Mode of presentation of cases**



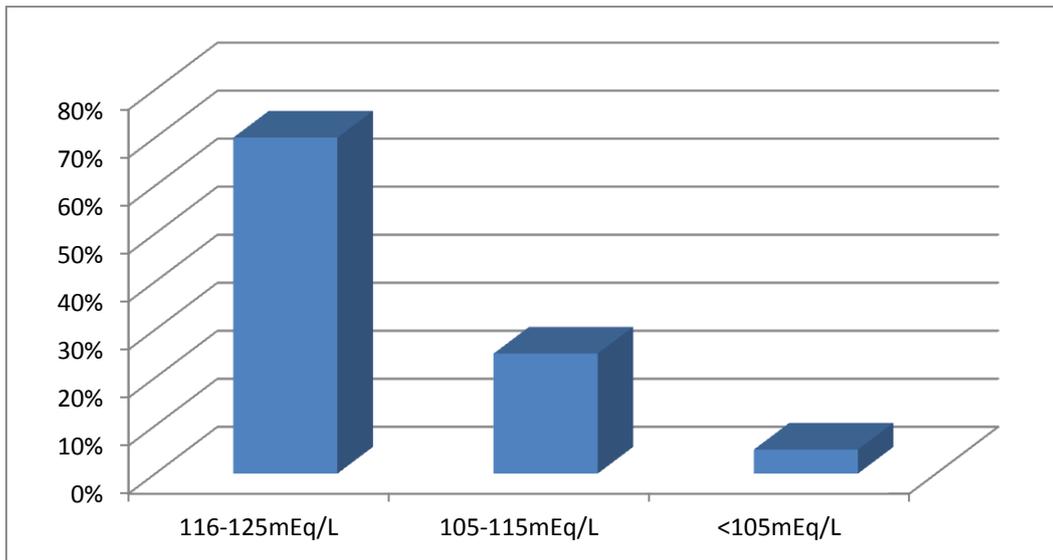
**Figure 4:** Clinical Presentation of cases of hyponatremia



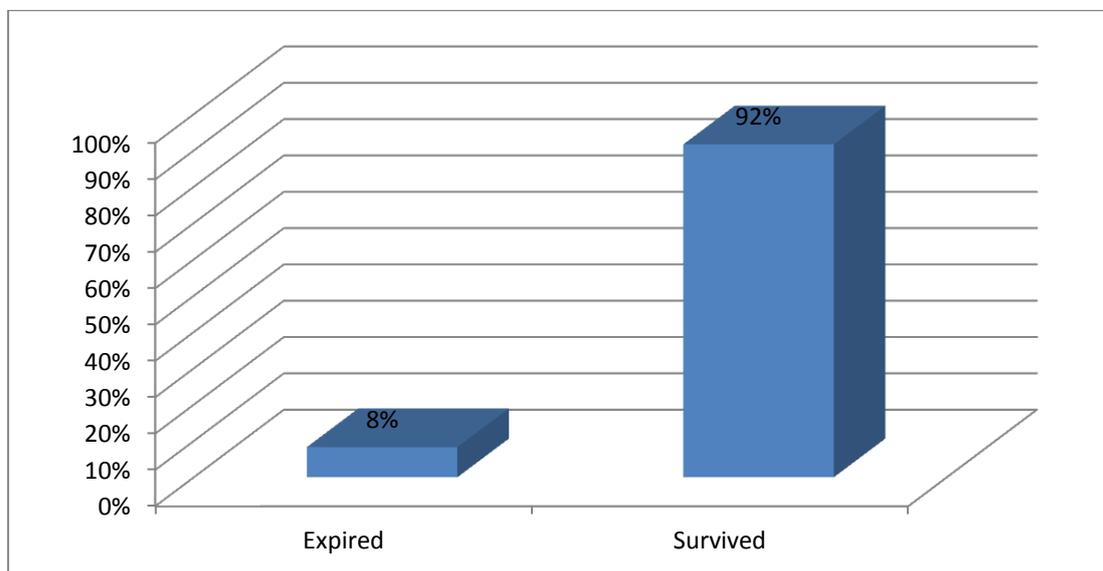
**Figure 5:** Volume Status of cases of hyponatremia



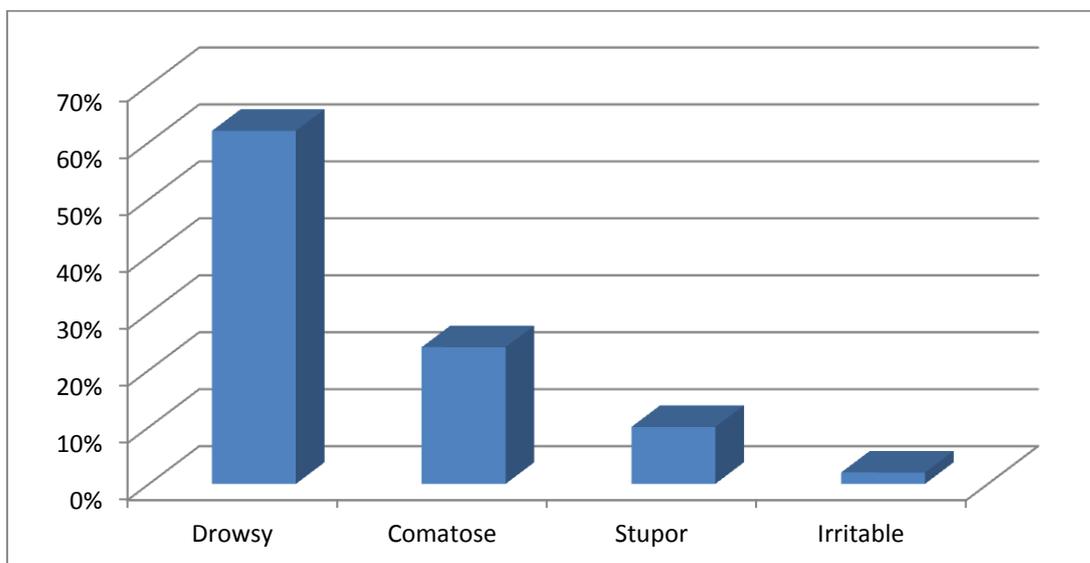
**Figure 6:** Distribution of underlying illness in the cases of hyponatremia



**Figure 7:** Severity of hyponatremia in cases



**Figure 8:** Outcome of patients



**Figure 9:** Level of altered sensorium in patients with hyponatremia

**Table 1:** Correlation between severity of hyponatremia and outcome:

Severity of hyponatremia \ Outcome	Survived	Expired
116-120mEq/L	41	1
105-115mEq/L	13	2
<105mEq/L	1	2

Chi square statistic 15.80. p value 0.00037

**Table 2:** Correlation between severity of hyponatremia and presence of coma:

Severity of hyponatremia \ Outcome	Comatose	Not comatose
116-125mEq/L	2	40
105-115mEq/L	10	5
<105mEq/L	2	1

Chi square statistic is 26.992. p value is < 0.00001

66 % of patients were using diuretics in our study group. 48% were using loop diuretics and 18 % were using thiazide diuretics.

**Table 3:** outcome and age of patients:

Age group \ Outcome	Survived	Expired
65-75 ears	44	2
>75 years	11	3

Chi square statistic 4.0994 and p value <0.42889.

## Discussion

In our study we had included 60 cases of symptomatic hyponatremia over a period of 1 year. We had attempted to categorize the cases according to the volume status and presenting symptoms clinically.

76% of cases were in the age group of 65-75 years of age. The mean age in males was 70 years and females was 74 years. This observation is consistent with the data that hyponatremia is a geriatric disease primarily<sup>15</sup>. 60% of the cases were males and 40% were females.

The most common presenting symptom was altered sensorium. 62% cases were drowsy, 24% cases were comatose, 10 % were stuporous and 2% were irritable.

In our study, we had a positive correlation between the degree of hyponatremia and the outcome as well as the presence of coma.

48 of the 60 patients were acute in presentation and 12 were having chronic presentation. The mean base line sodium in acute hyponatremia was 116mEq/L and in chronic hyponatremia it was 118mEq/L.

In our study, 48% had hypervolemia, 26% had euvolemia and 26% had hypovolemia.

Our study observed that the outcome was poor as the age advances, probably due to impaired adaptive mechanism due to poor metabolic reserve, co morbid illnesses and concomitant disease states.

## Conclusions

1. Severe symptomatic hyponatremia is common among elderly patients.
2. Mode of presentation is acute in most of the cases.
3. Females are more commonly affected.
4. Lower the base line sodium, severe the degree of altered sensorium.

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