



## CLINICAL PROFILE OF HYONATREMIA PATIENTS IN A TERTIARY CARE HOSPITAL

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### ABSTRACT

Hyponatremia is the most common electrolyte disorder among hospitalised patients occurring up to 22% and has been associated with increased mortality. There is scarce data about the clinical profile of hyponatremia in ICU settings. So this prospective study was conducted from July 2012 to September 2014 in Medical College Hospital and Research centre. A total of 50 cases of hyponatremia were studied. History and clinical examinations were recorded in all patients. Necessary laboratory and radiological investigations were done. We got 32 male cases and 18 female cases. Hyponatremia was commonly observed in the elderly age group. Out of them 5 patients had euvoemia, 31 patients had hypervolemia and 14 patients had hypovolemia. So from our study result we conclude that hyponatremia was found to be common in elderly age group. Hyponatremia commonly presents with nausea, headache, lethargy, restlessness, irritability, muscle weakness. Hypervolemic hyponatremia was the commonest presentation. Lowest level of serum sodium was associated with more prominent and severe complications.

**KEYWORDS :** Hyponatremia, Euvoemia, Hypovolemia, Hypervolemia

### INTRODUCTION:

Hyponatremia is an undertreated condition in clinical practice and defined as a serum sodium concentration  $<135$  mmol/L.<sup>1</sup> Hyponatremia can cause wide spectrum of clinical symptoms. It may be asymptomatic or present with symptoms ranging from nausea, lethargy to seizure and coma or even life threatening.<sup>2,1</sup>

Hyponatremia is the most common electrolyte disorder and occurring up to 22% among hospitalised patients.<sup>3</sup> Incidence of mild hyponatremia (plasma sodium 125–135 mEq/L) is 15%–30% among hospitalized patients and its incidence in intensive care unit patients is seen about 25%.<sup>4</sup>

Hyponatremia mostly occur due to disturbance of balance in water homeostasis, antidiuretic hormone regulation and renal loss of filtered sodium. Syndrome of inappropriate ADH secretion (SIADH) is common cause of hyponatremia. It is secondary to many clinical conditions. These conditions include malignancy, central nervous system diseases, some drugs and pulmonary diseases.<sup>5</sup>

Severe hyponatremia defined as serum sodium less than or equal to 115 mEq/L. The clinical presentation of severe hyponatremia is varied and ranges from mild, nonspecific symptoms like nausea, headache and lethargy to severe neurological symptoms such as seizure and coma. The knowledge regarding prevalence of electrolyte disturbances in a hospital is of the paramount importance. It will be useful for planning appropriate preventive strategies in that particular hospital. The data available regarding clinical presentation and aetiology of hyponatremia are rare in ICU settings. Hence, the present study was undertaken to assess the clinical profile to aid in the management of patients and to prevent further morbidity and mortality.

### MATERIALS AND METHOD:

The present study was conducted in Department of Medicine of Dr DY Patil Medical College Hospital and Research centre, Pimpri, Pune. This prospective study was done during July 2012 to September 2014 after approval by the institutional ethics committee. 50 patients who had hyponatremia (130mEq/L) on initial serum electrolyte analysis were considered for study after written informed consent. The inclusion criteria comprised of all diagnosed patients of

hyponatremia, admitted with serum Na levels  $<135$  mEq/L, patients who developed hyponatremia during hospitalization were also included in the study, patients of both genders were included in the study, patients of age 18 year and above were selected. The exclusion criteria comprised of cases of age  $<18$  years, peripheral vascular disorder. Patients were evaluated clinically to access their fluid status. Various lab tests were performed to detect the probable and underlying causes for hyponatremia. The routine investigations done in these patients were the haemoglobin, total count, differential count, erythrocyte sedimentation rate, serum electrolytes, electrocardiogram, chest x-ray, 24 hours urine sample for urine sodium, urine urea and urine glucose, blood sugar, urea and creatinine, urine osmolality. Other investigations like LFTs, CSF analysis, thyroid function, cortisol levels, abdominal ultrasonography, and computer tomographic scans were performed on some patients depending on the clinical suspicion.

Based on serum sodium level, these patients were divided into mild hyponatremia with serum sodium 125-130 mEq/L, moderate hyponatremia with serum sodium 115-124 mEq/L and severe hyponatremia with serum sodium less than or equal to 115 mEq/L.

Based on fluid status and urinary sodium these cases were further divided into euvolemic and hypervolemic and hypovolemic hyponatremia. Data was collected and analysed statistically.

### Statistical Analysis:

The collected data were analysed with SPSS 16.0 version. To describe about the data, descriptive statistics, frequency analysis, percentage analysis were used for categorical variables and for continuous variables the mean and S.D were used. To find the significance in categorical data, Chi-Square test and Fisher exact test was used. In all the above statistical tools, the probability value of  $<0.05$  was considered as significant level.

### RESULT:

**Table No 1: Age And Sex Wise Distribution Of Cases In Study Group**

AGE	Male	Female	Total
<20	3	0	3

21-30	6	3	9
31-40	5	2	7
41-50	5	5	10
51-60	7	4	11
>60	6	4	10
Total	32	18	50

**Table 2: Distribution Of Patients As Per Degree Of Hyponatremia / Serum Na+ Level (mMol/L)**

Degree of Hyponatremia Serum Na+ Level	No of cases	Percentage
Mild ( $\geq 125$ )	7	14

**Table No 4: Association Between Clinical Profile And Severity Of Hyponatremia In Study Group**

Clinical Profile	No of cases	Percentage	Severity of Hyponatremia			Chi square	P value
			Mild	Moderate	severe		
Nausea	45	90	7	28	10	1.37	>0.05
Vomiting	37	74	5	24	8	0.55	>0.05
Headache	9	18	1	4	4	2.52	>0.05
Lethargy	34	68	3	20	11	5.29	>0.05
Fatigue	48	96	7	30	11	0.93	>0.05
Restlessness	23	46	2	11	10	8.97	<0.01
Muscle weakness	36	72	2	23	11	8.93	<.01
Cramps	5	10	0	2	3	4.21	>0.05
Confusion	5	10	0	3	2	1.37	>0.05
Loss of appetite	46	92	6	28	12	1.54	>0.05
Irritability	17	34	0	10	7	6.81	<0.05
Spasms	9	18	0	5	4	3.52	>0.05
Seizure	1	2	0	0	1	3.23	>0.05

**Table 5: Comparison Of Urine Osmolality And Na+ Conc. According To Severity Of Hyponatremia In Study Group**

Urine	Severity of Hyponatremia						F value	P value
	Mild		Moderate		Severe			
	Mean	SD	Mean	SD	Mean	SD		
Osmolality	698.6	274.7	526.9	278.83	389.2	229.76	3.01	>0.05
Na+ conc ( mEq / L)	65.86	87.64	147.06	124.63	92.76	4.51	4.51	<0.05
Sr Creatinine mg%	1.96	1.91	5.76	6.67	5.40	4.02	1.28	>0.05
Uric Acid mg%	7.23	0.73	8.39	6.88	6.88	1.85	0.39	>0.05

**DISCUSSION:**

This study was done to describe the clinical profile of patients with hyponatremia in medical ICU. We studied 50 patients with hyponatremia admitted in intensive care unit for various symptoms and causes.

Age group of selected patients was between 20-80 years. Study result showed that hyponatremia was noted at all ages but majority of cases were in age group 41 to 60 years. This result was same as study done by Aqeel Raheem et al.<sup>6</sup> and Rahil A I et al.<sup>7</sup>

Out of total 50 cases, 32 (64%) cases were males and 18 (36%) cases were females. Similarly Nandakumar et al stated 44 cases (36.7%) were females and 76 cases (63.3%) were males.<sup>8</sup> Rahil A I, et al reported 33 cases were males (62.3%) and 20 cases were females (37.7%).<sup>7</sup>

In the present study fatigue, nausea and loss of appetite were common clinical presentations among the cases. Lethargy, muscle weakness restlessness and irritability were common symptoms associated with hyponatremia in the present study. This study finding was comparable to the study done by Mahavir Agrawal et al.<sup>9</sup> Patients with mild hyponatremia (plasma sodium 130-135 mmol/L) of any duration are usually asymptomatic. The earliest symptoms of hyponatremia are nausea and malaise typically seen when the concentration of plasma sodium falls below 125-130 mmol/L. neurological symptoms like headache, lethargy, restlessness and disorientation may follow as the concentration of sodium falls below 115-120 mmol/L. Seizure, permanent brain damage, brain stem herniation, coma, respiratory arrest and death

Moderate (115 - 124)	31	62
Severe ( $\leq 114$ )	12	24
Total	50	100

**Table No 3: Fluid Status Wise Distribution Of Cases In Study Group**

Fluid status	No of cases	Percentage
Euvolemic	5	10
Hypervolemic	31	62
Hypovolemic	14	28
Total	50	100

may occur with severe and rapidly evolving hyponatremia.<sup>10</sup> Metabolic disturbances like acidosis, hypoxia associated with hyponatremia increases the symptomatic severity. Gastrointestinal symptoms like nausea and vomiting are more common in patients with serum sodium levels between 125 and 130 mEq/L.<sup>11</sup>

The hydration status of the patients was diagnosed on the basis of clinical examination and was subdivided into euvolemic, hypovolemic and hypervolemic states. In the present study 5 patients had euvolemia, 31 patients had hypervolemia & 14 patients had hypovolemia. Thus hypervolemic hyponatremia was most common type of hyponatremia found in 62% cases followed by hypovolemic hyponatremia and euvolemia (10%) . Aqeel Raheem, AL-Barqawi et al, stated contradictory finding that euvolemic hyponatremia was the most common comprising (52%) of total cases.

In the present study among the hypervolemic hyponatremia renal failure (63%) was the most common cause followed by cirrhosis of liver (22.2%) and CHF (14.8%). In the study done by Nandakumar et al, two thirds of patients were of dilutional hyponatremia had CHF. The reminder had cirrhosis of liver.<sup>8</sup> Euvolemic hyponatremia which was least common type in our study was mainly due to SIADH.

Sr creatinine, uric acid, urea, urine osmolality were not significantly associated in our study. Only urine Na<sup>+</sup> concentration was significantly associated with hyponatremia.

So from our study result we conclude that hyponatremia was found to be common in elderly age group. Hyponatremia commonly presents with nausea, headache and lethargy, restlessness, irritability, muscle weakness.

Hypervolemic hyponatremia was the commonest presentation. Lowest level of serum sodium was associated with more prominent and severe complications.

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