



**A COMPARATIVE STUDY ON CLINICO-ETIOLOGICAL PROFILE AND
MANAGEMENT OF HYPONATREMIA IN TERTIARY CARE HOSPITAL**

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ABSTRACT

Objective: To analyze the prevalence, incidence of hyponatremia in medical ill patients and also to study the time taken for recovery of hyponatremia. **Method:** A Retrospective cohort study which was conducted on 100 patients above 18 years of age with serum sodium 125 mmol/L. The patients are retrospectively divided into two groups: Group A: Patients who are presented with hyponatremia to the hospital, Group B: Patients who either developed hyponatremia for the first time in the hospital or who's sodium levels fell further after admission. **Results:** Total cases of 100 patients out of which 73 cases were group A, and 27 cases were group B. Hyponatremia was found to be more prevalent in males (60%) than in females (40%). Based on age, incidence of hyponatremia in adult population is 18-65 years. Whereas, the incidence of hyponatremia in elderly population (>65 years) is higher. There is a significant no. of cases in overweight (according to BMI) category that is 40%, overweight category is followed by ideal weight (24%) and obese (27%). The most comorbidity was found to be Diabetes mellitus (60%), followed by hypertension (35%) and coronary artery disease (5%). Hyponatremia is more incident in ER (10%) + ICU (28.3%). In cancer patients, hyponatremia could be due to chemotherapy or several types of cancers cause excessive production of ADH leading to SIADH. Based on the symptoms vomiting and drowsiness each 41%, shortness of breath 26.60%, pedal edema 23.3%, were most common features seen in the patients followed by cough, diarrhea, fatigue and altered sensorium. **Conclusion:** This study indicated that hyponatremia is the most usual electrolyte imbalance met in clinical setup & it should be recognized and corrected early without any delay, as delaying the treatment would worsen the condition of patient.

KEYWORDS: Hyponatremia, hypervolemic, electrolyte imbalance, Plasma sodium levels.

INTRODUCTION

Plasma sodium levels which are below 135mmol/l in the body is called as Hyponatremia. This electrolyte imbalance is frequently encountered in hospital ambulatory settings. It is associated with plethora of underlying disease states and multiple etiologies with differing pathophysiological mechanisms which makes diagnosis challenging¹. The pathophysiological processes seen in Hyponatremia have different mechanisms because it is an outcome of varied spectrum of conditions. The difference in effective osmolality between brain and plasma, the water moves from extracellular to intracellular compartments resulting in swelling of brain cells. This generally occurs while there is a rapid development of hyponatremia leaving the brain with extremely little time to adapt the hypotonic environment. Eventually brain lowers the sum of osmotically active particles within its cells in an attempt to reinstate the brain volume. Hyponatremia is treated by treating the underlying causes, free water removal and using normal saline infusion. Based on the severity, which further depends on sodium concentration, patient

specific symptoms and time taken for them to develop, further treatment follows. Treatment of mild to moderate hyponatremia depends on underlying causes and etiology. To treat severe hyponatremia, critical care setting is required, where treatment is done by hypertonic or isotonic solutions which close monitoring of sodium correction rate. Safe rate of sodium correction is required to prevent osmotic demyelination syndrome that leads to cerebral edema. So, within 24 hours not more than 12 mEq/L and within 48 hours not more than 18 mEq/L of sodium should be corrected.

METHODOLOGY

It is a retrospective cohort study involving 100 subjects from a tertiary care hospital during a period of six months i.e., November 2021 to April 2022 after approval from the Malla Reddy Narayana Multispecialty Hospital.

Inclusion Criteria: All patients over 18 years of age with serum sodium \leq 125 mmol/L.

Exclusion criteria: Patients below 18 years of age,

Pregnant and lactating women.
 Patients in whom repeat sodium estimation was above 125 mmol/L

STUDY PROCEDURE

The study was initiated after obtaining ethics committee approval. Patients who are eligible as per the inclusion criteria are included in the study. Data was collected according to data collection form annexure. A detailed history and physical examination of all included patients will be collected as per pre-determined proforma with emphasis on etiological factors, symptoms and signs, treatment of Hyponatremia.

The patients are retrospectively divided into two groups

Group A: Patients who are presented with Hyponatremia to the hospital.
 Group B: Patients who either developed Hyponatremia for the first time in the hospital or whose sodium levels fell further after admission.

STUDY OUTCOMES

Comparison of demographic and clinical profile between the two groups.
 Comparison of precipitating factors of Hyponatremia between the two groups.
 Comparison of time taken for recovery and treatment of hyponatremia between the two groups.

STATISTICAL ANALYSIS

The collected data were analyzed by Microsoft excel. Data was summarized by mean ± SD for continuous data and percentage for categorical data.

RESULTS

Table 1: Number of patients in both the groups.

GROUP	NO. OF PATIENTS
A	73
B	27

Group A consists of 73 and group B consists of 27 patients respectively.

GROUP A: Patients who are presented with hyponatremia to the hospital.

GROUP B: Patients who either developed hyponatremia for the first time in the hospital or whose sodium levels fell further after admission.

Table 4: Comparison of incidence and prevalence of hyponatremia between two groups based on comorbidities.

COMORBIDITIES	GROUP A	GROUP B	TOTAL
DM	48(40.0%)	12 (12.0%)	60 (60%)
Hypertension	29(29.0%)	6(6.0%)	35 (35.0%)
CAD	5 (5.0%)	0	5(5.0%)

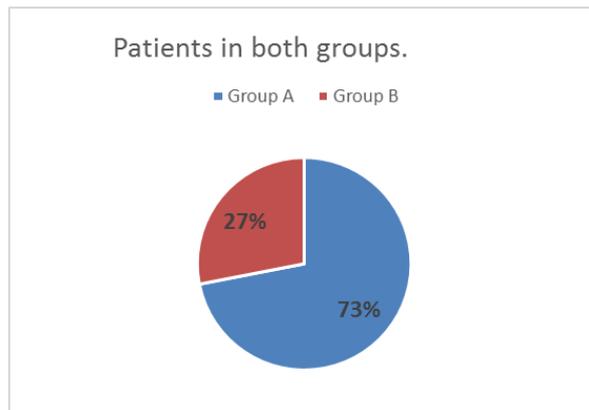


Fig. 1: Number of patients in both the groups.

Table 2: Comparison of incidence and prevalence of hyponatremia between two groups based on gender.

Category	Total	Group a	Group b
FEMALE	40 (40%)	32 (80.0%)	8 (20.0%)
MALE	60 (60%)	50 (83.0%)	10(17.0%)

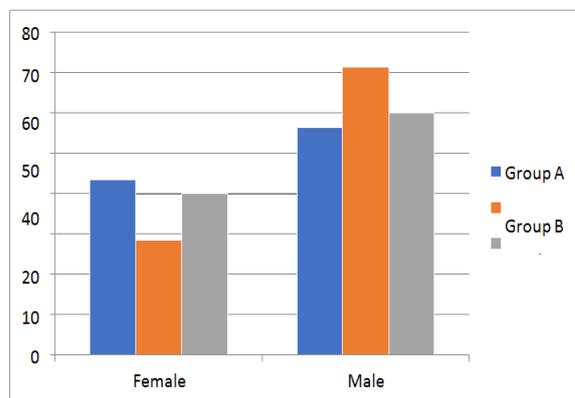


Fig 2: Comparison of incidence and prevalence of hyponatremia between two groups based on gender hyponatremia was found to be more prevalent in males (60%) than in females (40%). It was more prevalent in females in group A compared to group B. It was more prevalent in males in group B compared to group A.

Table 3: Comparison of incidence and prevalence of hyponatremia between two groups based on age.

AGE	GROUP A	GROUP B	TOTAL
18-65	45(45.0%)	20 (20.0%)	65 (65%)
65+	23(23.0%)	12 (12.0%)	45(45%)

Based on age, incidence of hyponatremia in adult population (18-65 years) in higher in group B compared to group A.

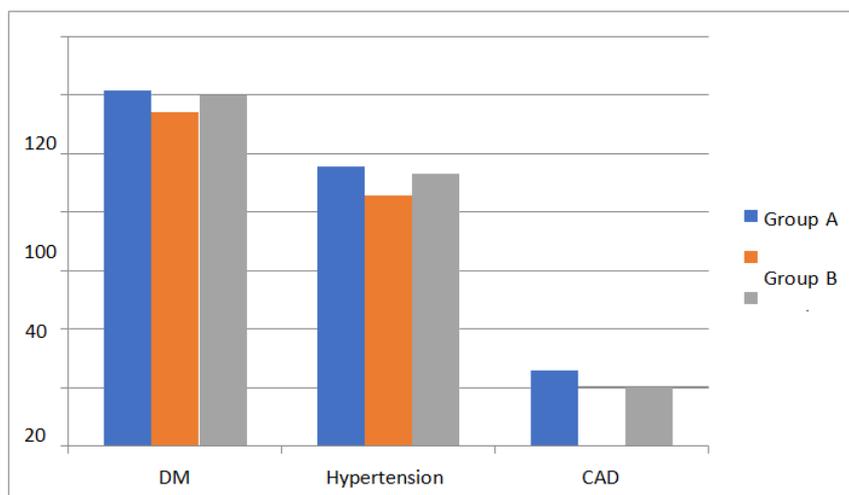


Fig. 3: Comparison of incidence and prevalence of hyponatremia between two groups based on comorbidities. The most common comorbidity was found to be Diabetes mellitus (60%) in the both the groups, followed by hypertension (35.0%) and coronary artery disease (5%).

Table 4: Comparison of incidence and prevalence of hyponatremia between two groups based on departments.

DEPARTMENT	GROUP A	GROUP B	TOTAL
GENERAL	21 (35.0%)	7 (11.6%)	28(46.6%)
ICU	7(11.6%)	10 (16.6%)	17(28.3%)
ER	6(10.0%)	0	6 (10.0%)
ER+ICU	7(11.6%)	2 (3.0%)	9(15.0%)

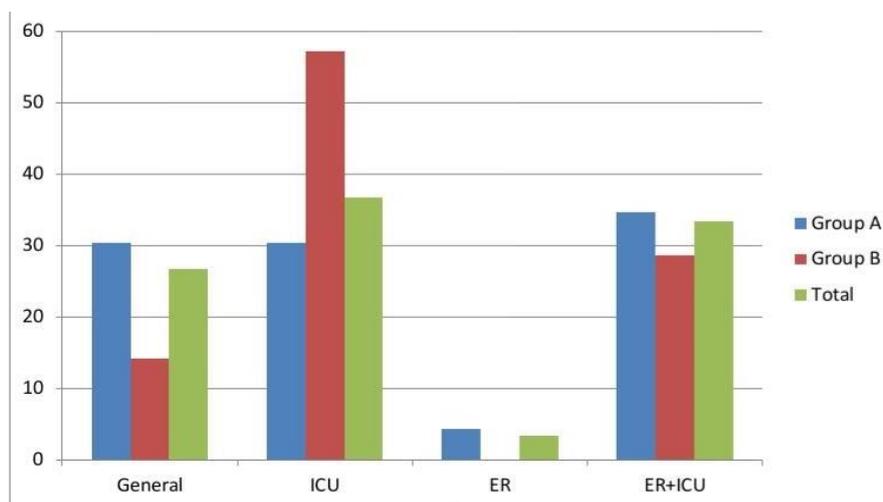


Fig. 4: Comparison of incidence and prevalence of hyponatremia between two groups based on departments. Hyponatremia is more incident in ER+ICU in group A patients. (These are the patients who have been admitted initially in emergency and then shifted to ICU). In group B, it is more incident in ICU hospitalized patients.

DISCUSSION

Hyponatremia is a usually encountered electrolyte imbalance in hospital and ambulatory setting. The different etiologies of hyponatremia and numerous formulae for its improvement makes it difficult to the health care professionals. Treatment of hyponatremias a major challenge for clinicians on many aspects. Despite similar serum sodium concentrations clinical manifestations may range from mild to life threatening. To overcome this challenge physicians must manage hyponatremia determining the causes with appropriate

diagnostic evaluation and case specific clinical, laboratory parameters & the associated clinical risk.

CONCLUSION

From our study, we conclude that hyponatremia is the most usual electrolyte imbalance met in clinical setup & it should be recognized and corrected early without any delay, as delaying the treatment would worsen the condition of patient. This study adds to the literature that the guidelines concerning the managing of Hyponatremia is being followed. Increased loss of sodium from the body was discovered to be the another common cause,

via gastrointestinal loss or due to surgeries. Care must be exercised while using diuretics, intravenous fluid and such patients must be monitored closely. The most common treatment of hypovolemic hyponatremia is 3% NaCl + NS. Symptoms correlate with severity and rate of decline of sodium concentration. Degree of symptomatology is surrogate for duration of hyponatremia.

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