

Research Article

**An assessment of hyponatremia in cases of metabolic encephalopathy
presenting at Nawaz Sharif Social Security Hospital, Lahore**

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ABSTRACT

Objective: To assess the hyponatremia in cases of metabolic encephalopathy presenting at Nawaz Sharif Social Security Hospital, Lahore.

Material and methods: This cross sectional study was conducted at Department of Medicine, Nawaz Sharif Social Security Hospital, Lahore from January 2017 to June 2017 over the period of 6 months. Total 50 cases of metabolic encephalopathy were selected and hyponatremia was assessed.

Results: Out of 50 cases of metabolic encephalopathy, hyponatremia was developed in 21 (42%) cases. Male patients were 38 (76%) and female patients were 12 (24%). Majority who developed hyponatremia had age between 61 to 80 years. most common etiology is diuretic induced (33%), followed by diabetic ketoacidosis (19%), chronic liver disease (19%), chronic kidney disease (14%), SIADH (4%), and hypothyroidism (4%).

Conclusion: Results of this study showed higher rate of hyponatremia. Common causes of hyponatremia found are intake of diuretics and excessive renal loss. Most of the hypertensive patients in the present study group were on thiazide or potassium sparing diuretics. Diabetes mellitus and dyslipidemia were important co-morbidities of hyponatremia.

Keywords: Hyponatremia, Metabolic encephalopathy, Hypertension, Diabetes mellitus, Dyslipidemia

INTRODUCTION

Hyponatremia is considered as one of the most common and important electrolyte abnormalities which must be considered in all seriously ill hospitalized patients.¹ It is a common complication of malignancy, neurosurgical conditions, cardiac, liver, and renal failure and pulmonary disorders. Hyponatremia occurs in 15–30% of hospitalized patients.² The commonest cause of hyponatremia is the syndrome of inappropriate antidiuretic hormone

(SIADH).³ This syndrome was first described by Bartter and Schwartz.⁴ Hyponatremia is defined as a serum sodium concentration less than 135 mmol/L, between 130 and 134 mmol/L as mild hyponatremia, between 125 and 129 mmol/L as moderate hyponatremia and severe hyponatremia as a serum sodium concentration < 125 mmol/L.⁵

Few studies have shown that hyponatremia is associated with the development of metabolic

encephalopathy but there are no published estimates of the prevalence of hyponatremia. So the objectives of the study were to identify the etiological factors for hyponatremia.

Operational definition:

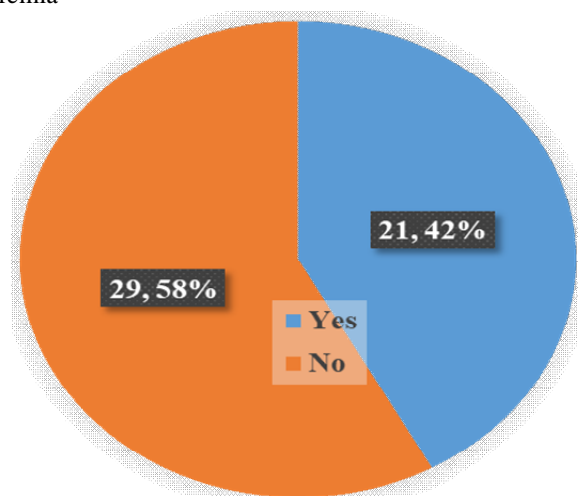
Hyponatremia was considered to present when the serum sodium was less than (135)meq/L.

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Medicine, Nawaz Sharif Social Security Hospital, Lahore from January 2017 to June 2017 over the period of 6 months. Total 50 cases of metabolic encephalopathy having age >18 years either male or female were selected for this study.

Patients having age <18 years, patients with chronic hyponatremia, chronic use of diuretics and other ACE/ARB inhibitors, patients with malnutrition and patients with recent history of major surgery or head trauma were excluded from the study. An approval was taken from hospital ethical committee. Written informed consent was taken from every patient. 5ml blood sample was taken from every patient and send to laboratory for the assessment of hyponatremia. Lab findings were entered in pre-designed performa along with demographic profile of the patients. Collected data was entered in SPSS version 18 and analyzed. Mean as SD was

Fig. 1: Frequency of hyponatremia



calculated for numerical data and frequencies were calculated for categorical data.

RESULTS

Out of 50 cases of metabolic encephalopathy, hyponatremia was developed in 21 (42%) cases. Fig. 1 Male patients were 38 (76%) and female patients were 12 (24%). Fig. 2 Majority who developed hyponatremia had age between 61 to 80 years. Clinical profile of metabolic encephalopathy patients with hyponatremia was studied, which revealed that in most of the patients, confusion (62%), followed by nausea/vomiting (57%), delirium (14%), seizure (9%) was observed. From the study of etiology of metabolic encephalopathy patients with hyponatremia, it was found that the most common etiology is diuretic induced (33%), followed by diabetic ketoacidosis (19%), chronic liver disease (19%), chronic kidney disease (14%), SIADH (4%), and hypothyroidism (4%) (Table 1).

From the study the most common precipitating factors for hyponatremia found are diuretics (47.6%), followed by GI loss (23.8%), hyperglycemia (19%), and mannitol (9.5%) (Table 2). Patients with different disorders were studied for hyponatremia and it was found that there is association hypernatremia and various disorders as mentioned in Table 3.

Fig. 2: Gender distribution

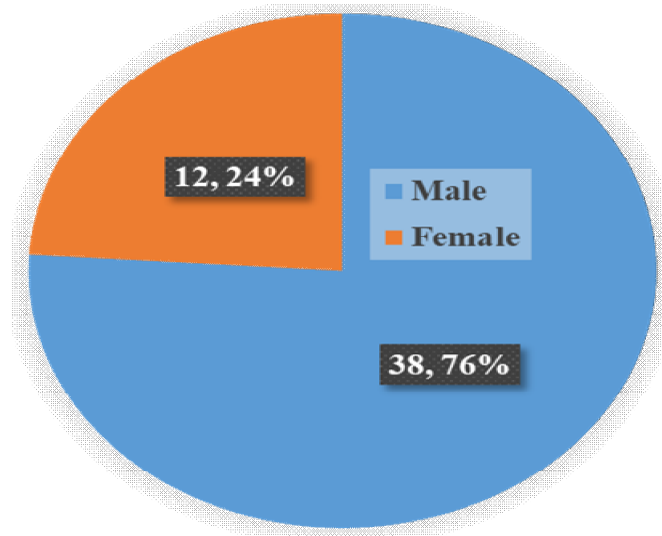


Table 1: Etiology and clinical profile of cases

Variables	No of patients (n=21)	Percentage %
M/F	16/5	76/24
Age group		
Less 40	1	9
41 to 60	7	28
61 to 80	12	92
81 above	1	100
Nausea/Vomiting	12	57
Confusion	13	62
Delirium	3	14
Seizure	2	9
SIADH	1	4
Diabetic ketoacidosis	4	19
Chronic liver disease	4	19
Chronic kidney disease	3	14
Diuretic induced	7	33
Hypothyroidism	1	4
Alcoholic liver disease	1	4

Table 2: Precipitating factors

Variables	No of patients (n=21)	%
Diuretics	10	47.6
GI loss	5	23.8
Hyperglycemia	4	19
Mannitol	2	9.5

Table 3: Hyponatremia present in patients with different disorders

Name of disorder	Patients with hyponatremia (%)
Diabetes mellitus	43.85
Hypertension	55.93
Chronic liver disease	31.57
Chronic kidney disease	35.29
Dyslipidemia	69.56
Metabolic encephalopathy (past history)	31.57
Liver function test abnormality	24

DISCUSSION

Objective of this study was to assess the hyponatremia in cases of metabolic encephalopathy presenting at Nawaz Sharif Social Security Hospital, Lahore.

In the present study, hyponatremia (serum sodium <135 meq/L) was observed in 42% of intensive care unit patients. While in study of Ashish Upadhyay et al, hyponatremia (serum sodium <135 mEq/L) was observed in 42.6% in the acute hospital care group patients.⁶ Majority of the patients in this study were males, in compared to this, in the study by Agarwal et al predominantly 64.3% patients were males.⁷ This is contrary to the finding of MY Rao et al where 55 patients were females and 45 patients were males with preponderance of hyponatremia in elderly sick females.⁸

Most of the patients in our study were in the age group of 61-80 years. The mean age of patients with hyponatremia in the present study was 70 years. This is similar to the study by Rao MY et al in which it was found that mean age of the patients with hyponatremia was 72 years.⁸ On the other hand, Agarwalet al in their study had most patients who were young.⁷ The mean age of patients was 48.7±16.7 years (15-82 year).

Increased loss of sodium from the body was observed in 57% patients, most commonly via gastrointestinal route (nausea/vomiting). This is more than that reported by Agrawal et al where it was found 26 (37.1%).⁷ Confusion was observed in 62% patients with hyponatremia which is compared with the study by Agrawal et al⁷ where it was 29 (41.4%), but in MY Rao et al study it

was found only 2%. Only 14% of the patients with hyponatremia were presented with delirium. This is comparable with Agrawal et al (17.1%).¹⁰ 9% of the patients with hyponatremia presented with seizures. While in Rao MY et al only 4% had developed seizure and Agrawal et al study it was 29.9%.⁷⁻⁸

The common co-morbid conditions were hypertension 55.93%, diabetes mellitus 43.85%, chronic renal failure 35.29% according to the present study, as compared to this 62, 51 and 22 percent respectively was reported by MYRao et al study.⁸ Only 31.5% of patients with hyponatremia in the present study had chronic liver disease, which is less than Ashish Upadhyay et al study in which 14 percent patients found with chronic liver disease.⁶ While 69.56% had dyslipidemia, 31.57% had past history of metabolic encephalopathy and 24% had liver function test abnormality in the present study.

Analysis of the causes of hyponatremia in the present study patients revealed that most of the patients had multiple etiological factors in elderly patients with hyponatremia. Other factors found to reduce dietary salt intake were intake of only liquid feeds and patients put on Ryle's tube feeds. The conventionally fed fluids in our country, orally or through Ryle's tube are sugar based like fresh fruit juices, milk, tea and coffee, glucose water and tender coconut water. Soups and canned juices with salt are not a part of our traditional meal. This has made inappropriate feeds an important factor responsible for the development of in-hospital hyponatremia. This

agrees with the causes of hospital acquired hyponatremia as reported earlier.⁹⁻¹⁰ A larger study with controls needs to be done to establish the effect of salt restriction and inappropriate Ryle's feeds in patients.

CONCLUSION

Results of this study showed higher rate of hyponatremia. Common causes of hyponatremia found are intake of diuretics and excessive renal loss. Most of the hypertensive patients in the present study group were on thiazide or potassium sparing diuretics. Diabetes mellitus and dyslipidemia were important co-morbidities of hyponatremia.

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