

Prevalence in Hyponatremia in Acute Coronary Syndrome: A tertiary care hospital experience

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Abstract

Background: To study the prevalence of hyponatremia in the patients admitted with Acute Coronary Syndrome.

Methods: A total of 68 patients were included in the study. A prospective ,single centre, observational study was carried out at IGMC Shimla during one year period. All the patients with ACS (STEMI, NSTEMI, USA) enrolled were patients with age >18 years, ACS confirmed on the basis of ECG, cardiac biomarkers and typical chest pain. Serum sodium levels were measured at the time of admission, at 24 hours and at the time of discharge.

Observations: Of the 68 patients 62% were male, most common age of presentation being 41-60 years of age. Hyponatremia was found in 29.4% of the study population.

Conclusion: Total 68 patients included in our study hyponatremia was found in 20(29%) of the ACS patients at admission.

Keywords: Hyponatremia, ACS, Prevalence

Introduction

Coronary heart disease is a major cause of death and is a global health problem reaching epidemic in both developed as well as in developing countries. It is the highest killer in developed countries and is rapidly assuming a similar role in developing ones. Cardiovascular disease remains the leading cause of death in United States, responsible for 840,768 deaths (635,260 cardiac) in 2016, from 2006 to 2016, the US death rate from CVD decreased by 18.6% and from coronary heart disease by 31.8%¹⁻⁶.

Hyponatremia is defined as serum sodium levels of less than 135mEq/L⁷, is a very common disorder occurring in upto 22% hospitalized patients. This disorder is almost always the result of an increase in circulating AVP/and or increase sensitivity to AVP, combined with the intake of free water⁷.

Clinical picture of hyponatremia depends upon both the magnitude and rapidity of decrease in plasma sodium level. In acute hyponatremia (i.e, developing in <2days), patient may complain of nausea and malaise with (Na+) of approximately 125mEq/L. As the plasma

sodium level falls further symptoms may progress further to include headache, lethargy, confusion, and obtundation. Stupor, coma and seizures may occur at serum sodium level of less than 115 mEq/L. In chronic hyponatremia (>48 hours duration), adaptive mechanisms designed to defend cell volume occur and tend to minimize the increase in ICF volume and its symptoms.

Hyponatremia is a well known electrolyte disorder in hospitalised patients and it can make the prognosis worse depending upon the background. Hyponatremia is associated with exaggerated activation of baroreceptor mediated hormones, including arginine vasopressin (AVP), catecholamines, and the renin-angiotensin-aldosterone system⁸⁻¹⁰.

Material and methods

Study design: Cross-sectional observational study.

Setting: Tertiary care hospital

Study period: One year from 1st July 2018 to 30th June 2019.

Study population

The study had been conducted in patients admitted to the Department of Medicine IGMC Shimla for acute coronary syndrome and who satisfied the inclusion criteria.

Study tool: A structured proforma was used to record the information ascertained. It included demographic information and a brief history regarding presenting complaints, relevant past history, personal history and family history was recorded. Patients were subjected to detailed clinical examination. Hematological and biochemical investigations were done as a part of routine workup. Serum sodium level was collected on day of admission, at 24 hours and at the time of discharge.

Inclusion Criteria

1. Patients with acute coronary syndrome admitted to Medicine Department IGMC SHIMLA.
2. Patients aged > 18 years
3. Those who consent to participate in the study were included.

Exclusion criteria

1. Patients with valvular heart disease, congenital heart disease and cardiomyopathy.
2. Patients with major non-cardiovascular disorder which causes hyponatremia such as renal diseases, vomiting, diarrhoea, SIADH.
3. Any systemic infection.
4. Patients not willing to give consent.

Observations

The present study was aimed to determine the prevalence of hyponatremia in the patients admitted with Acute Coronary Syndrome and its association with outcome of patients at 30 days and 90 days follow-up. A total of 68 patients were included in the study at Department of Medicine, IGMC Shimla. Results of the study have been described below.

Table 1: Socio-demographic profile (n=68)

Mean age in Yrs	60.3824 ±13.8489
Male : Female	42 : 26
BMI	22.347 ±13.6068 kg/m ²

Of the total 68 patients admitted for ACS in Cardiac Care Unit of Medicine department - IGMC Shimla, most common age group affected at presentation was 40-60 years 31 (45.58%), with patients in age group between 61-80 were 28 (41.19%). There were 5 (7.35%) patients in age group between 20-40 years, and patients with age more than 80 years were 4 (5.88%). Mean age of the patients with ACS was 60.3824 ±13.8489 years. 42 (62%) were males and remaining 26 (38%) were

females. The mean BMI of patients was $22.347 \pm 13.6068 \text{ kg/m}^2$.

Table 2: Profile of ACS patients among hyponatremic and non hyponatremic patients

	Non-hyponatremia (n=48)	Hyponatremia (n=20)	P value
1.STEMI	27 (56.2%)	14 (70%)	0.548
2. NSTEMI	19 (39.6%)	5 (25%)	
3.USA	1 (2.1%)	0 (0%)	
4.QWMI	1 (2.1%)	1 (5%)	

Among the patients admitted with ACS, 14(70%) had STEMI, while 5(25%) patients had NSTEMI, and q wave MI was present in 1(5%) patients in hyponatremic group.

Discussion

The study was conducted at IGMC SHIMLA in the Department of Medicine during the year 2018-19. A total of 68 patients were studied, after excluding all the patients who fall in the exclusion criteria of the study. Of total 68 patients 68% were males.

Most common age group presented with ACS was between 41-60 years(45.6%), next being the 61-80 years age group(41.1%) and the mean age was 60.3824 ± 13.8489 years. A study on clinical profile and 30-day outcome of women with acute coronary syndrome as a first manifestation of ischemic heart disease by Nanjappa V et al also showed that the mean age at presentation for ACS was 64.4 ± 11 years¹¹⁻¹⁴. This may be attributed to higher risk characters in young age group like smoking, multiple substance abuse, sedentary life style etc.

Smoking was the major modifiable risk factor among patients with ACS, both hyponatremic as well as in non-hyponatremic group, present in 55.88% of the population with 95% confidence limit of 43.32% -

67.92%. Of total, 38.24% of the females had smoking history, either current or past.

Of total 68 patients in the study 60.3% were having STEMI, 35.3% had NSTEMI, 1.5% had USA and remaining 2.9% had q wave MI, almost similar to that seen in study conducted by Mahmaud AH et al which reported STEMI in 52% and NSTEMI in 48%¹⁵. The prevalence of STEMI was 62.4% and NSTEMI was 27.1% in study conducted by Nanjappa V et al and the mean BMI in their study was $23.64 \pm 3.23 \text{ kg/m}^2$ which is also almost similar to our study¹¹⁻¹⁴ i.e $22.3471 \pm 3.6068 \text{ kg/m}^2$.

Our study was aimed to find the prevalence of hyponatremia among patients with ACS. There were limited studies regarding the prevalence of hyponatremia, and also there were wide variations in the results of those studies. Its prevalence ranges from 11% Goldberg et al to 28% as seen in study conducted by Aziz F et al¹⁶⁻²⁵. Mahmoud AH¹⁵ et al found prevalence of hyponatremia as 74%. In our study prevalence of hyponatremia was found to be 29.4%, which is almost similar to most of the studies conducted previously. Patients with mild hyponatremia were 22.06% 2.94% were having moderate hyponatremia and severe hyponatremia was seen in 4.41% of the patients.

Conclusion

Hyponatremia was found in 20(29%) of the ACS patients admitted to Medicine department IGMC Shimla

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