

Inspecting the Occurrence of Hyponatremia and the Yearly Clinical Outcomes in Patient Hospitalised for Decompensated Heart Failure

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ABSTRACT:

Aim: The survey's goal was to look at occurrence of hyponatremia and the 1-year results of Pakistani individuals who were admitted to the hospital for decompensated heart failure by a decreased expulsion fraction.

Methods: The entire 520 individuals who were admitted through HFrEF from 19 collaborating institutions were included in historical research. Our current research was conducted at Cardiology Hospital Multan from May 2020 to June 2021. Participants were diagnosed as normonatremic (136–148 mEq/L) or hyponatremic (136–148 mEq/L) based on their blood sodium levels on the day of admission. (136 mEq/L.) The researchers looked at one-year all-cause death, re-hospitalization rates, and effect of changes in sNa at time of release on health outcomes.

Results: Hyponatremia remained seen in 28% of the individuals. On admission, hyponatremia participants show lower BP, serum creatinine, and left ventricular ejection fraction, as well as greater serum creatinine and BUN levels than normonatremia individuals. Hyponatremia was related with greater 1-year all-cause death (15% vs. 3.7%, $p=0.002$) and readmitting rates (47.8% vs. 34.8%, $p=0.006$). After controlling for variables, hyponatremia remained an independently related predictor of 1-year all-cause death (adjusted HR, 4.763; 95% CI, 1.942–12.765; $p=0.002$). Solitary 51.9% of hyponatremic participants were restored to normonatremia (136 mEq/L) at discharge. Chronic hyponatremia was considered a major cause of all-cause death ($p=0.002$).

Conclusion: This analysis revealed that hyponatremia remains very prevalent and is related through higher 1-year all-cause death and re-hospitalization rates in Pakistani people through HFrEF. At discharge, around 53% of participants with initial low sNa had chronic hyponatremia, and those individuals had poorest patient outcomes.

Keywords: Hyponatremia, 1-Year Clinical Outcomes, Decompensated Heart Failure.

INTRODUCTION:

Hyponatremia is a recurrent condition in individuals hospitalized for heart failure, with a frequency ranging from 9% to 29%. Aside from being common, it has also been shown as a poor predictive

biomarker for both outpatients and hospital admissions with HF [1]. It has been linked to both short- and long-term negative effects, as well as all mortality. This is true not just for individuals with low EF, but also for these through HF and maintained EF [2]. The majority of European and Asian nations submitted necessary information regarding hyponatremia and its inspiration on health outcomes in HF individuals. The survey's goal was to look at the prevalence of hyponatremia and the 1-year outcomes of Pakistani cases who were hospitalized for decompensated heart disappointment by a decreased ejection fraction [3]. There is no data on the prevalence of hyponatremia and its relationship to health outcomes in Pakistani individuals with HF. As a result, we investigated the incidence of hyponatremia and its associated 1-year patient results (death rates and hospital length of stay) in cases admitted to the hospital for respiratory failure HF through decreased EF [4]. Because pertinent information is limited, we similarly looked at relationship between variations in serum sodium at discharge and 1-year death. Our current research is anticipated to close the hyponatremia gap and provide insight into the health outcomes of Pakistani admitted individuals for HF [5].

METHODOLOGY:

In 21 primary care cardiology facilities in Pakistan, we conducted a retrospective record review study on individuals who were hospitalized due to deteriorating HF. Elderly patients (>19 years old) were eligible to participate in research if they exhibited clinical symptoms of HF, were hospitalized for the management of deteriorating HF before May 2021, and had left ventricular EF of 48 percent as measured by echocardiography at the time of hospitalization. Our current research was conducted at Cardiology Hospital Multan from May 2020 to June 2021. Participants were diagnosed as norm naremic (136–148 mEq/L) or hyponatremic (136–148 mEq/L) based on their blood sodium levels on the day of admission. (136 mEq/L.) The researchers looked at one-year all-cause death, re-hospitalization rates, and the effect of changes in sNa at the time of release on health outcomes. The first 510 charts from the questionnaire focuses were chosen based on the index hospitalization admission date. There were no further major limitations. Participants were diagnosed from a medical chart using International Classification: 9th Revision Codes.

All variables were collected from the individual patient records, comprising medical assessment and comprehensive in-hospital medication history, and put into the electronic case report forms. On admission, laboratory data such as sNa, potassium, creatinine, and BUN values were collected. The Cockcroft–Gault formula was used to determine renal function [creatinine clearance]. In addition, the discharge sNa (defined as the final sNainside 2 days preceding discharge) was recorded in CRF. Missing data was labelled as unidentified. Our current research adhered to the Helsinki Declaration. The collaborating center's Institutional Ethics Committee accepted the study protocol. The major goals of this study were to evaluate 1-year all-cause death and re-hospitalization rates after index hospitalization for HF in individuals with initially hyponatremia with those with normal natremia. At the follow-up, all-cause death and re-hospitalization data were retrieved from treatment plans files or received by phone from a sibling or government agency. Patients were considered to be active at time of investigation in the lack of confirmed death. Cos of the difficulties to collect complete data from all individuals, further clarification of the reason of mortality was not undertaken. For categorical variables, the chi-square test remained applied, and for incessant data that were not spread generally, the Mann–Whitney U test was applied. The post-discharge Cox-proportional hazards model was applied to assess the relationship between sNa intensity and long-term outcomes in patients. To demonstrate death, Kaplan–Meier survival curves been created. To examine

differences across groups, the long-rank test was utilized. Severity over time were discovered through individual analyses across designated groups. The findings were given as figures of authority with 96% confidence level. The SPSS 24 program was used to examine all of the data.

RESULTS:

Table 1 shows the treatment options of all individuals as well as individuals divided into two categories, hyponatremia and norm natremia. Individuals remained primarily males having the age of 68 years (73 percent). The number of patients (62.5 percent) had coronary artery illness as the cause of their heart failure. On hospital admission, 31% of patients had hyponatremia. sNa was decreased in hyponatremia individuals, as predicted. The two sets were equivalent in terms of age, gender, diabetes, and smoking history. There was a significant difference between those who have hyponatremia as well as those with normal blood pressure (p=0.004 for SBP and 0.002 for DBP). Serum creatinine and BUN levels were considerably higher (p=0.002 and p=0.002, correspondingly) and CrCl and left ventricle EF were considerably lower (p=0.019 and p=0.001) in hyponatremic participants than in norm natremia patient populations. Hyponatremia [6.39; 96 percent CI, 3.46–12.9, p0] was a predictor of death in the entire sample [0.002] as well as left ventricular EF [HR 2.076; 96 percent CI, 1.03–1.14, p=0.007]. Hyponatremia was substantially related with 1-year all-cause death in a logistic regression model utilizing normnatremic individuals as a baseline (HR 7.72; 96 percent CI, 3.97–16.16; p0.002). Even after controlling for left ventricular EF, systolic BP, and serum creatinine, hyponatremia was related with 1-year all-cause death (adjusted HR 5.763; 96 percent CI 27.5–12.77; p=0.002). Table 2 shows the results of 1-year all-cause death divided by groups grounded on change in sNa levels at release. Table above shows the result of 1-year both deaths separated by groups based on change in sNa levels at discharge. Adults with chronic natremia had the lowest 1-year all-cause mortality, while those with chronic hyponatremia had maximum (3.6 percent vs. 21%, p0.002). The all-cause death rates were significantly diverse between the two with chronic hyponatremia vs. hospital-acquired hyponatremia and corrected hyponatremia vs. norm natremia (p=0.015 and p=0.013, individually).

Figure 2 depicts the Kaplan–Meier survival curves for the four groups. Conversely, the rate of rehospitalization remained maximum in group with persisting hyponatremia and smallest in group with norm natremia (48.3 percent vs. 28.3 percent, p=0.006).

Table 1:

	Total n=496	Norm natremia N=156	Hyponatremia N=340	P
Men, %	345 (73.2)	240 (69.2)	105 (30.8)	0.976
Age, years	66 (19–91)	65 (24–92)	63 (17–90)	0.597
BMI, kg/m2*	66 (15.4)	42 (12.7)	27 (18.6)	0.108
Diabetes mellitus	29.7±5.6	29.7±5.8	29.2±5.1	0.423
Heart failure etiology				
Ischemic	39 (8.8)	22 (7.2)	17 (12.3)	0.115
Non-ischemic	298 (62.5)	211 (61.3)	87 (62.6)	
Unknown	157 (34.2)	115 (34.8)	42 (29.5)	

Table 2:

	Total n=496	Norm natremia N=156	Hyponatremia N=340	P
ARBs	11.8	10.4	10.2	0.523
ACE inhibitors	47.9	45.9	52.8	0.165
Antiarrhythmics	8.5	6.8	8.8	0.547
Beta blockers	57.8	55.8	62.6	0.193
IV furosemide	48.6	45.3	58.7	0.006
Digitalis	21.6	18.6	25.2	0.391
Spirolactone	26.3	23.6	31.9	0.037
HCTZ	19.4	17.4	24.2	0.095

Figure 1:

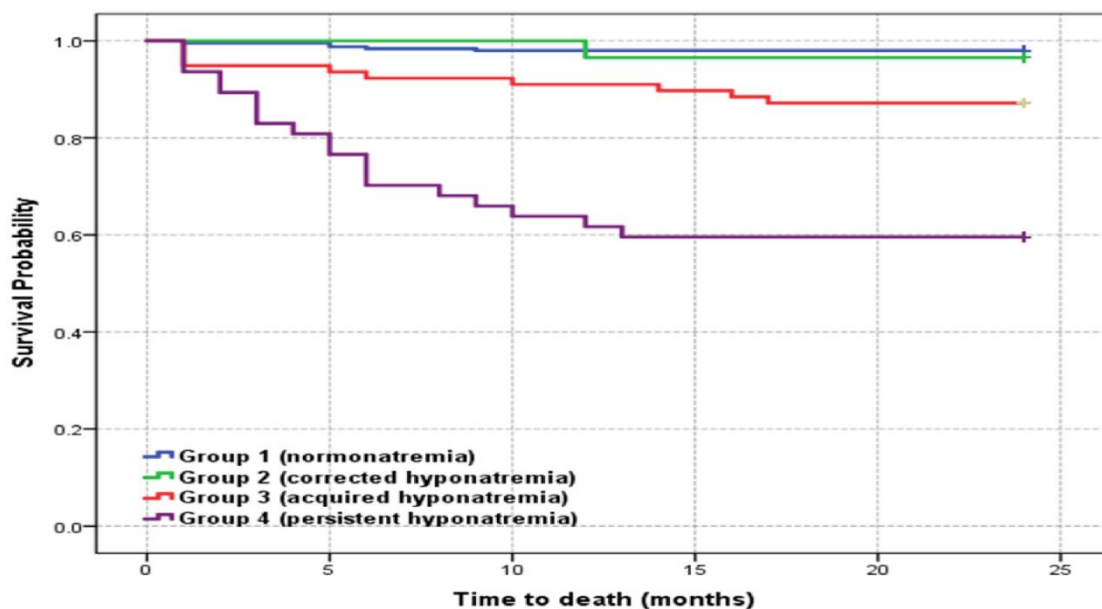
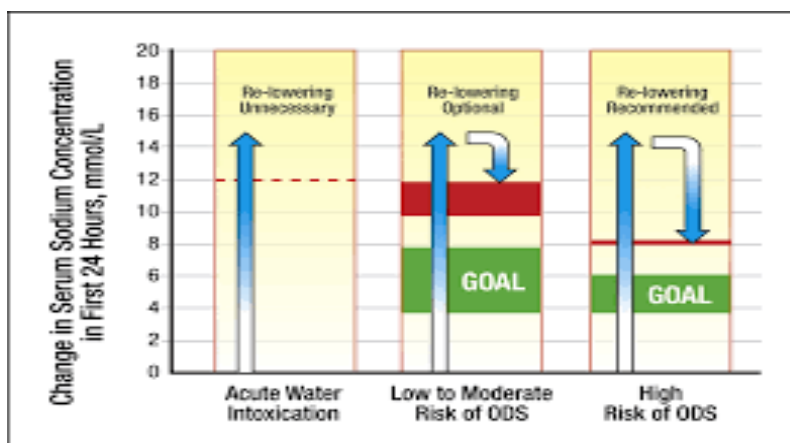


Figure 2:



DISCUSSION:

The outcomes of a recent retrospective research conducted in Pakistani individuals support original hypothesis from other nations, indicating that affected individuals and hyponatremia had higher death and rehospitalization rates in comparison to norm narmemic patients [6]. The negative predictive effect of hyponatremia on treatment practice in patients with hf can be considered to be retained in Pakistani patients. Hyponatremia individuals had poorer left ventricular systolic function and worse renal function [7]. Furthermore, while individuals with diabetes hyponatremia have the most adverse health results, treatment of hyponatremia on admission in the hospital may reduce rehospitalization and death rates. In this research, we discovered that indications of even more acute HF, just like decreased EF, lower blood pressure, and abnormal kidney function, were more prevalent in hyponatremia subjects. Even though no link was found among decreased left ventricular EF and hyponatremia [8]. Substantial in some research, the findings of others corroborate the meaningful correlation, as demonstrated by this study. Lower systolic blood pressure, another predictor of poor prognosis in HF, remained very common in hyponatremic individuals. Whenever similar literature was discovered. Based on the evidence, this seems to be a nearly universal conclusion. Interestingly, this enhanced the requirement for injectable inotropes, as evidenced by previous investigations. Serum creatinine, BUN, and CrCl values in hyponatremic individuals in our research group suggest poor renal function [9]. Serum creatinine levels were also shown to remain higher in the majority of prior investigations. Patients with hyponatremics Na levels stayed in hospital for very extended period of time than individuals having normal sNa values. Several investigations evaluating the span of hospital stay in hypo- besides normnarmemic individuals got the same results [10].

CONCLUSION:

Hyponatremia is frequent in Pakistani individuals admitted to the hospital for deteriorating HF. Low sNa levels remained an isolated and significant source of enlarged death and admission in the hospital in this cohort. Whereas individuals who had chronic hyponatremia throughout their hospitalization would have the poorest outcomes, it is unclear if treating this electrolyte imbalance may improve event-free mortality in patients with hf. A bigger demographic is required to validate our results in the future.

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