

Clinical Symptoms and Characteristics of Hospitalized Patients with Profound Hyponatremia

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Background & Aim

Background:

- Profound hyponatremia, defined as a serum sodium value below 125mmol/L is common and occurs in 2-3% of hospitalized patients.
- Hyponatremia is associated with substantial morbidity and mortality.
- Symptoms of profound hyponatremia vary among patients between non-specific symptoms such as nausea or malaise or acute life threatening brain oedema.

Aim of the study:

- To prospectively assess patients characteristics, symptoms related to hyponatremia, aetiological causes and management in patients with profound hyponatremia admitted in two tertiary care centers in Switzerland

Patients & Methods

Setting:

- Patients admitted to University Hospital of Basel and the Kantonsspital Aarau with a documented profound hyponatremia ($\text{Na}^+ < 125\text{mmol/L}$) were included in the study.
- On admission all vital signs, Glasgow Coma Scale, actual symptoms, complete medical history including comorbidities, current medication and medication before hospitalisation were recorded in a standardised bed-side patients interview.
- Patients were carefully monitored during hospitalization and changes in laboratory values and concomitant comorbidities and mortality were recorded. Further a special attention was paid to the initial recorded symptoms and therapy management of hyponatremia.

Results

Table 1: Baseline Characteristics at Admission

Patients Characteristics	(N= 298)
Median [IQR] age, y	60 [71-81]
Female, n (%)	195 (65%)
Median [IQR] laboratory variables	
Plasma sodium, mmol/L	120 [116-123]
FE _{Na} , %	36.8 [29.6-46.9]
FE _{Urea} , %	10.6 [7.3-15.1]
Urine sodium, mmol/L	51 [29-80]
Urine osmolality, mmol/L	371 [277-484]
Median [IQR] vital signs	
Systolic blood pressure, mmHg	136 [118-154]
Diastolic blood pressure, mmHg	71 [62-81]
Heart beats/min	79 [68-90]
Temperature, °C	37.0 [36.5-37.5]
Final Differential Diagnoses, n (%)	
Primary Polydipsia	24 (8%)
Cortisol deficiency	4 (1%)
SIAD	106 (36%)
Diuretic-induced	72 (24%)
Hypervolemic Hyponatremia	33 (11%)
Hypovolemic Hyponatremia	59 (20%)
Volemic status, n (%)	
Hypovolemic	82 (28%)
Euvolemic	173 (58%)
Hypervolemic	43 (14%)
General information, n (%)	
Mortality	12 (4%)
ICU stay	103 (35%)

Table 2/ Figure 1: Symptoms in Patients with Profound Hyponatremia

Symptoms, n (%)	
Weakness	205 (69%)
Fatigue	175 (59%)
Nausea	130 (44%)
Sensation of thirst	112 (38%)
Disturbance of memory	107 (36%)
Disturbance of concentration	103 (35%)
Disturbed gait	92 (31%)
Vomiting	91 (30%)
Disorientation	90 (30%)
Headache	79 (27%)
Acute fall	60 (20%)
Recurrent falls	47 (16%)
Focal neurological deficits	17 (5%)
Acute epileptic seizures	16 (5%)
Fractures	11 (4%)

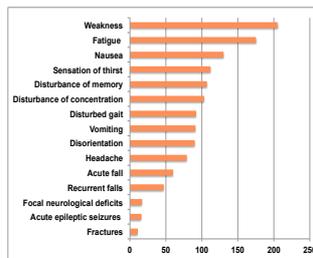


Table 5/ Figure 3 and 4: Comorbidities in patients with profound hyponatremia

Comorbidities, n (%)	
Hypertension	199 (67%)
Previous dysnatremia	125 (42%)
CNS diseases	114 (38%)
- craniocerebral injury	16 (5%)
- dementia	13 (4%)
- epilepsy	19 (6%)
- psychiatric diseases	37 (12%)
- cerebrovascular diseases	16 (5%)
- other	32 (11%)
Pulmonary diseases	82 (28%)
Renal failure	64 (21%)
Congestive heart failure	44 (15%)
Alcohol abuse	37 (12%)
Liver cirrhosis	23 (8%)

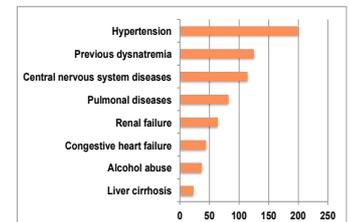


Table 3/ Figure 2 :Medication prescribed prior hospitalization

Medication, n (%)	
Thiazid diuretics	130 (44%)
Angiotensin-converting-enzyme inhibitors	82 (35%)
Angiotensin-II-receptor blocker	67 (28%)
Loop diuretics	55 (18%)
Selective serotonin reuptake inhibitor (SSRI)	44 (15%)
Non steroidal anti-inflammatory drugs (NSAAR)	41 (14%)
Potassium sparing diuretics	34 (11%)
Opioids	29 (10%)
Neuroleptics	27 (9%)
Other antidepressants	24 (8%)
Other antiepileptics	23 (8%)
Carbamazepin	13 (4%)
Tricyclic antidepressant	11 (4%)

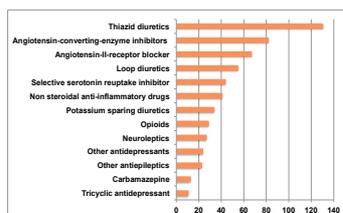
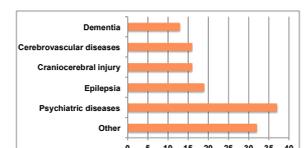


Table 4: Causes of death during hospitalization

Causes, n (%)	
Heart failure	4 (33%)
Septic shock	3 (25%)
Liver insufficiency	2 (17%)
Respiratory insufficiency	2 (17%)
Terminal renal failure	1 (8%)



Summary & Conclusion

Profound hyponatremia is accompanied by a wide spectrum of different symptoms. Most patients suffered from moderate symptoms reflecting rather chronic hyponatremia with brain cell adaptation. Patients presenting with a profound hyponatremia had several comorbidities and prior medications.