

HYPERNATREMIA AND COPEPTIN LEVELS IN THE ELDERLY HOSPITALIZED PATIENT

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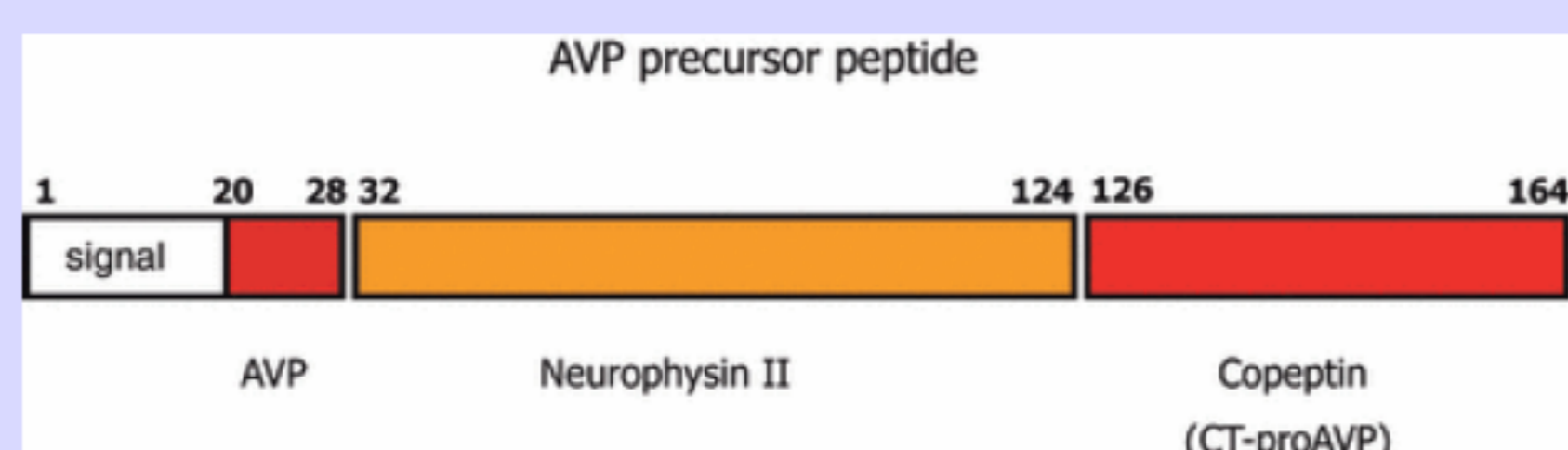
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Introduction

- ❖ Elderly patients have a higher prevalence of hypernatremia compared to the remainder of the population.
- ❖ Hypernatremia is associated with serious morbidity with poor prognosis(1).
- ❖ ADH (Antidiuretic hormone) secretion is triggered via hyperosmolarity and/or blood volume reduction, both present in dehydrated hypernatremic patients.
- ❖ Previous studies suggested that ADH secretion was inadequate among elderly hypernatremic patients(2).
- ❖ Measurement of ADH is difficult due to its instability in plasma and is therefore, not done routinely.
- ❖ **Copeptin** is the C terminal part of the ADH precursor and is more stable in plasma, better reflecting plasma ADH levels(3).

Study Objectives

- ❖ To detect demographic and clinical characteristics of the elderly hypernatremic patient hospitalized in the internal medicine/geriatric ward.
- ❖ To increase the understanding of the role of ADH (Copeptin) secretion in the pathogenesis of hypernatremia in the elderly.



Methods

This case control study was performed in the Internal Medicine/Geriatric ward, Shaare Zedek Medical Center, Jerusalem.

Participants: 33 elderly hypernatremic patients (admission sodium >150 meq/l, age >70) compared to 34 normonatremic patients.

Measurements: Demographic, functional (mental status and ADL) and clinical data (APACHE II score) were collected at admission and Copeptin levels were obtained 48 hours from admission.

Mortality and change in the functional status were followed up to 30 days after discharge.

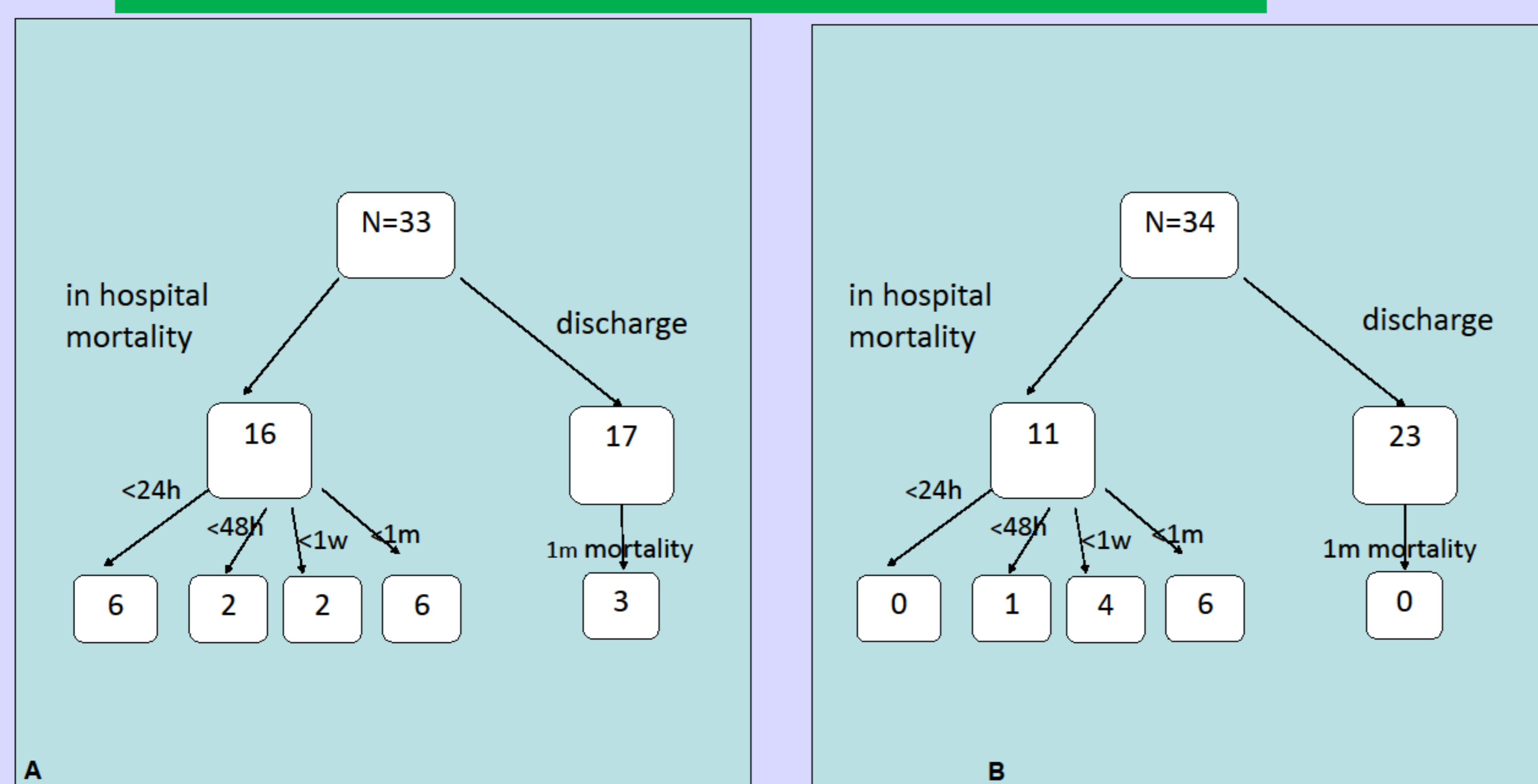
Results

- ❖ Patients with hypernatremia presented with significantly lower baseline functional and cognitive states and higher APACHE II score (21.3 ±8.6 vs. 15.4 ±6.7, P<0.01).
- ❖ Mortality within 30 days of discharge was higher in the hypernatremic group (58% vs. 32%, P<0.05).
- ❖ Higher Copeptin levels were found in the hypernatremic group compared to the normonatremic group (100.2±60.6 pmol/L vs. 66.5±57.2 pmol/L, P<0.05).
- ❖ High levels of Copeptin were associated with higher in hospital (P<0.05) and 30 days mortality (P<0.01).
- ❖ Sodium levels were found to correlate with Copeptin levels; yet, an even stronger correlation was demonstrated between Copeptin levels and Apache II score (r= 0.52, p<0.001).

Parameter	Normonatremic	Hypertremic	p-value
	N (%)	N (%)	
Age (mean±sd)	85.5 (±6.1)	87.5 (±6.7)	0.2
Gender (male)	13 (38%)	13 (39%)	0.92
Functional status			< .05
Independent	8 (23%)	1 (3%)	
Infirm/frail	2 (6%)	4 (12%)	
Dependent	24 (71%)	28 (85%)	
Cognitive state			< .0001
Sev/mod dementia	16 (47%)	32 (97%)	
Normal/mild	18 (53%)	1 (3%)	
Serum Na(meq/l)	136.5± 4.4	160.6± 11.2	< .0001
Osmolarity(osm/l)	293.5± 12.6	349.3± 26.2	< .0001
Copeptin (pmol/l)	66.4± 57.1	100.2± 60.6	< .05
APACHE II Score	15.4 ±6.7	21.3 ±8.6	< .01
Albumin(gr/dl)	2.8± 0.3	2.6± 0.3	< .05
GCS	14.2± 2	11.5± 3.4	< .0001

Figure showing outcome measures in hypernatremic (A) and normonatremic patients (B)

Table showing demographic, clinical and lab data on admission



Conclusions

- 1) Hypernatremia in the elderly at admission is associated with a high rate of mortality.
- 2) Copeptin level in the elderly seems to be a good single disease severity marker.
- 3) Copeptin is secreted in high concentrations by elderly hypernatremic patients

References:

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3. Dobsa L, Edozien KC. Copeptin and Its potential role in diagnosis and prognosis of various diseases. *Biochem Med (Zagreb)* 2013; 23(2):172-90.

