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Identifying Risk Factors for Significant Hyponatremia during Vasopressin Administration in Neonates

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Identifying risk factors for significant hyponatremia during vasopressin administration in neonates

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In newborns receiving vasopressin for blood pressure support, hyponatremia is associated with higher fluid intake and higher creatinine levels

BACKGROUND: Vasopressin could be an effective medication to raise blood pressure in neonates, but limited literature exists regarding safety in this population. Significant hyponatremia has been observed with the use of vasopressin locally, which warrants further investigation.

METHODS

1. Approval obtained from UNMC/CHMC IRB
2. Included all neonates who received medications to raise blood pressure admitted 1/1/13 - 4/1/23
3. Collected serum electrolytes and fluid intake/output for first 7 days after starting vasopressin
4. Significant hyponatremia defined as <130 mEq/L at any point in the first 7 days

RESULTS

- 47 infants met inclusion; 22 had significant hyponatremia
- No significant difference in demographics between hyponatremic and normal sodium groups

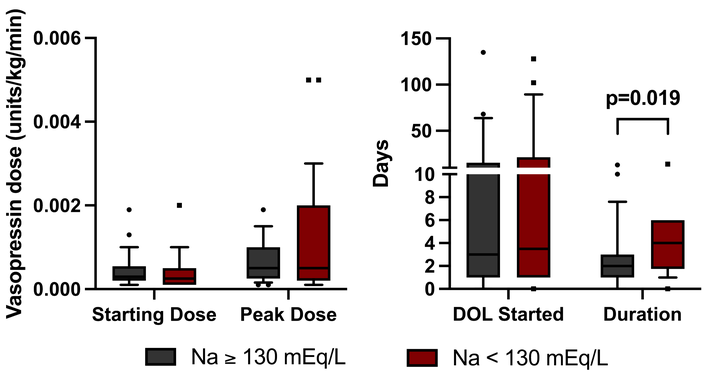

Figure 1. No differences in starting dose, peak dose, or the day of life (DOL) vasopressin was initiated, but hyponatremia group had longer vasopressin treatment duration.

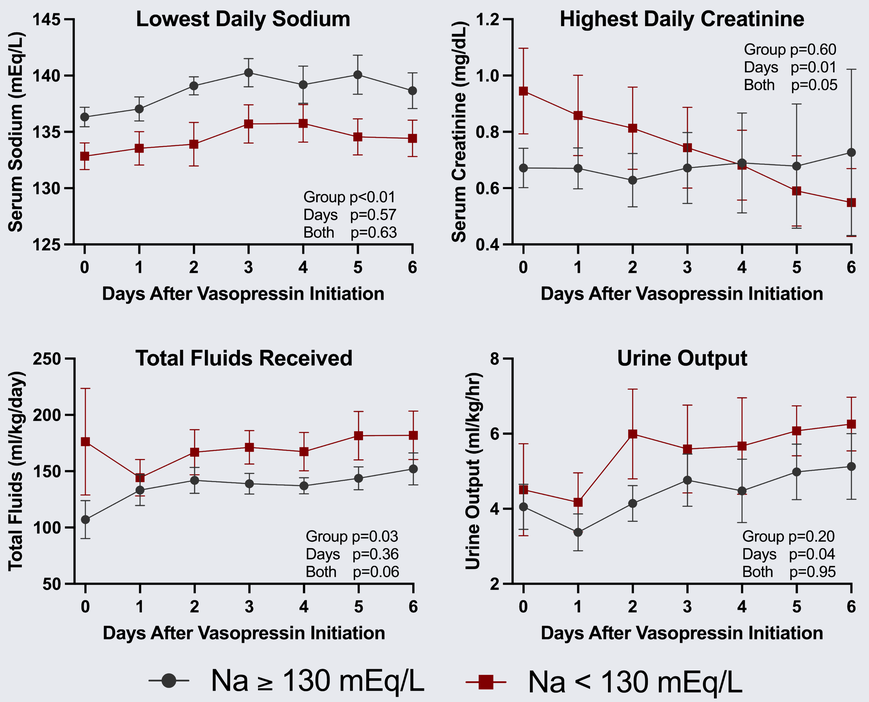

Figure 2. Electrolytes, total fluids, and urine output for first week after vasopressin initiation. p values listed are from mixed linear model for difference by sodium group ("group"), days, or both.

Table 1. Demographics and outcomes, stratified by serum sodium group. Categorical: n (%), continuous: median (min, max). *3 missing in Na ≥ 130 mEq/L group

	Na < 130 mEq/L (n=22)	Na ≥ 130 mEq/L (n=25)	P value
Gestational age (weeks)	35.6 (23.6, 40.6)	37.0 (24.1, 40.3)	0.601
Birth weight (kg)	2.34 (0.40, 4.14)	2.78 (0.44, 3.62)	0.717
Female	12 (54.5%)	14 (56.0%)	1.000
Small for gestational age	1 (4.0%)	4 (18.2%)	0.171
C-Section	13 (59.1%)	18 (72.0%)	0.376
Race*			1.000
Black	4 (18.2%)	4 (18.2%)	
White	9 (40.9%)	10 (45.5%)	
American Indian/Native	0 (0.0%)	1 (4.5%)	
Two or more races	3 (13.6%)	2 (9.1%)	
Hispanic ethnicity	6 (28.6%)	4 (18.2%)	0.389
1 min Apgar	4 (1, 9)	4 (1, 8)	0.393
5 min Apgar	6 (1, 9)	7 (2, 9)	0.859
Need for ECMO	5 (22.7%)	5 (20.0%)	1.000
Need for nitric oxide	15 (68.2%)	24 (96.0%)	0.018
Length of stay	33 (2, 360)	19 (2, 296)	0.162
Survived to discharge	10 (47.6%)	12 (48.0%)	1.000

CONCLUSIONS

- Hyponatremia was associated with higher initial creatinine and total fluids and longer duration of vasopressin
- Groups did not differ by gestational age, birth weight, initial dose, or peak dose of vasopressin
- These data could aid in the development of clinical guidelines to help direct the safe and effective administration of vasopressin for blood pressure support in neonates

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