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Table

POINT OF CARE ULTRASOUND (POCUS) AND THE APPROACH TO HYPONATREMIA: A CASE SERIES

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Introduction

Hyponatremia is a common condition in clinical practice characterized by low blood sodium levels (<135 mmol/L), which can have severe neurological consequences and increase the risk of mortality. It's management requires identifying the underlying cause, which can sometimes be challenging.

We propose the use of point-of-care ultrasound (PoCUS) as a valuable tool for phenotyping hyponatremia based on extracellular volume and determining the potential etiology. We present five clinical cases from a third-level hospital in Colombia, describing the findings associated with each case.

Results

Methodology

Presentation of five clinical cases of patients treated at a thirdlevel hospital in Colombia between January and June 2023, who presented with hyponatremia of various etiologies. In these cases, PoCUS was performed, and the documented findings were correlated with the flowchart presented in Figure 1, leading to a change in medical management



Table 1.			
Clinical case	PoCUS findings	Phenotype	Change in medical behavior
69-year-old patient with altered mental status	A pattern VExus score 0 Intermediate VTI (Figure 2)	Euvolemic hyponatremia	Adrenal insufficiency diagnosis Fluid restriction Serum cortisol
74-year-old-patient with leg edema, NYHA III and yugular distension	B pattern VExus score 1 Low VTI (Figure 3)	Hypervolemic hyponatremia	Heart failure diagnosis Diuretic therapy NT-proBNP
53-year-old patient with leg edema, NYHA III and lung rales	B pattern VExus score 2 Low VTI (Figure 4)	Hypervolemic hyponatremia	Heart failure diagnosis Diuretic therapy NT-proBNP
18-year-old patient cerebral MRI with basal ganglia lesion resection	A pattern VExus score 0 Low VTI (Figure 5)	Hypervolemic hyponatremia	Cerebral salt wasting syndrome diagnosis Fluid restriction
28-year-old, HIV positive, secondary headache, positive cryptococcus antigen in CSF	A pattern VExus score 0 Hight VTI (Figure 6)	Redistributive	Hypoalbuminemia diagnosis Serum albumin Nutritional input

VExus: venous excess ultrasonography; VTI: velocity time integral; NYHA: New York Heart Association; NT-proBNP: N-terminal pro-brain natriuretic peptide; MRI: magnetic resonance imaging; HIV: human inmunodefficiency virus: CSF: cerebral spinal fluid.



Image B represents an interior vena cava ultrasound, demonstrating vanability and a iameter less than 20 mm (15 mm). Image C illustrates the measurement of VTI in TS'



Conclusion

Hyponatremia demands a comprehensive evaluation. Non-invasive methods are proposed, such as PoCUS, which, in conjunction with clinical findings and paraclinical tests, enable the characterization of patients volume status and determination of the type of hyponatremia. Estimating extracellular volume offers clues regarding the etiology. Despite its usage limitations and the scarce literature in this domain, its implementation emerges as an innovative strategy to enhance early identification and management of hyponatremia.