

STRESS HYPERGLYCEMIA RATIO AS A MARKER OF DISEASE SEVERITY IN HOSPITALIZED PATIENTS WITH ACUTE PYELONEPHRITIS

Francisco Sousa Santos¹; Margarida Fonseca²; Ana Pãosinho²; Inês Cruz²; João Sequeira Duarte¹; Clotilde Gouveia¹; Alberto Mello e Silva²; Carlos Vasconcelos¹

Endocrinology (1) and Internal Medicine (2) Departments, Egas Moniz Hospital, Centro Hospitalar Lisboa Ocidental.

Objectives

Hyperglycemia has been associated with worse outcomes in hospitalized patients with a variety of diseases, namely critical illness. It's been recently proposed that a relative hyperglycemia ratio - Stress Hyperglycemia Ratio (SHR) – might be even better associated with disease outcomes. We studied how SHR correlated with various morbidity parameters in hospitalized patients due to acute pyelonephritis.

Methods

- We conducted a retrospective study in a Portuguese central hospital, including every patient admitted to Medicine or Endocrinology wards with the main diagnosis of acute pyelonephritis (which had HbA1c measured during the stay) between 2012 and 2015.
- SHR was calculated as admission glycemia (mg/dL) divided by estimated average glucose derived from HbA1c.
- We assessed the duration of the hospital stay, analytical markers (such as estimated glomerular filtration rate – eGFR – at admission) and Systemic Inflammatory Response Syndrome (SIRS) criteria at admission.

Results

- A total of 57 patients (71,9% female) were included, with a mean age of 76,7 years old.
- 77,2% had the diagnosis of Type 2 Diabetes and all the remainder were non-diabetic.
- 45,6% had sepsis criteria (presumed infection and ≥ 2 SIRS criteria).
- The mean duration of hospital stay was 12,4 days. 2 deaths were registered.

	Mean	Minimum	Maximum
Age (years)	76,9	38	91
Glycemia (mg/dL)	171,8	78	367
HbA1c (%)	7,3	4,5	14
SHR	1,1	0,3	3,1
PCR (mg/dL)	17,6	1	28
eGFR (CKD EPI formula) (mL/min/1.73 m ²)	57,6	5	102
Nr. SIRS criteria	1,48	0	4
Length of hospital stay (days)	12,8	3	96

	Age (years)	Nr. of SIRS criteria	Length of Hospital stay (days)	Nr. of discharge diagnosis	PCR at admission	eGFR (CKD EPI formula)
SHR	N/S	N/S	0,303*	N/S	N/S	N/S
Glycemia	N/S	0,341*	N/S	N/S	N/S	N/S
HbA1c	N/S	N/S	N/S	N/S	N/S	N/S

Pearson correlation coefficients between various variables. N/S – not significant. * - $p < 0.05$

- After adjusting for age, sex and diabetes presence, SHR (but not glycemia) correlated positively – correlation coefficient= **0,908** - with the number of SIRS criteria ($p = 0.033$).

Conclusion

SHR, which takes into account background glycemia rather than absolute glycemia alone, might be a biomarker of disease severity in case of patients hospitalized with acute pyelonephritis, irrespective of being diabetic or not. Given this was a retrospective study and sample size was rather small, further studies are needed to confirm this hypothesis and to assess SHR relation with clinical outcomes, namely mortality.

Bibliography

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