Stress hyperglycemia ratio and long-term clinical outcome in patients with acute coronary syndrome

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Background: Stress hyperglycemia is strongly associated with adverse prognosis in patients with acute coronary syndrome (ACS). Recently, the stress hyperglycemia ratio (SHR - relationship between acute/chronic glycemic values) has been proposed as a better measurement of stress hyperglycemia. Studies on SHR and long-term clinical outcome in ACS are limited. This study aimed to clarify the association between SHR and 3-year adverse clinical events in patients with ACS.

Methods: We analyzed data of 795 patients admitted to our center for ACS who were enrolled in the PRATO-ACS Registry (ClinicalTrials.gov ID: NCT04087200) and underwent laboratory analyses 1 month after the index event. All patients had undergone early invasive strategy and received high intensity statins during hospitalization and at discharge. Patients were stratified in baseline SHR tertiles: < 0.95, ≥ 0.95 to < 1.17 and ≥ 1.17. The primary end point was 3-year all cause death; secondary end points were major adverse clinical events (MACE) including all-cause death, myocardial infarction or congestive heart failure. The association between SHR and outcome measures was evaluated with Cox proportional analysis expressed by hazard ratio (HR) and 95% confidence intervals (CI).

Results: With increasing SHR, there was a significant progressive increase in mortality (4.2, 8.3, and 11.7% in the 1st, 2nd, and 3rd tertile, respectively, p=0.006) and MACE (10.6, 14, and 20.8% in the 1st, 2nd, and 3rd tertile, respectively, p=0.004). Multivariable analysis shows that SHR was an independent predictor of 3-year all-cause death (HR 1.65, 95% CI 1.12-2.4; p=0.012). Subgroup analysis evidenced that the relationship between SHR and mortality was statistically significant only for patients with poor glycemic control at 1 month follow up (HR 3.4, 95% CI 1.14-10.9, p=0.02 in the 2nd tertile and HR 3.9, 95% CI 1.3-11.8, p=0.015 in the 3rd tertile).

Conclusion: Baseline SHR is significantly associated with 3-year all-cause death and MACE in patients with ACS. However, its prognostic impact is much stronger in patients who do not achieve desired glycemic targets at 1 month after the index event. Therefore, insistent attention to glycemic values is mandatory in ACS patients even after discharge.