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Coronary Artery Disease, Acute Coronary Syndromes, Acute Cardiac Care –
Acute Cardiac Care, Cardiac Care Unit (CCU), Intensive, and Critical Cardiovascular Care

Cardiovascular disease in an intensive care unit: patterns of an often fatal omen

B. Rocha[1], G. Cunha[1], S. Maltes[1], A.N.N.E. Moura[2], F. Coelho[2], J. Torres[2], P. Santos[2], F. Monteiro[2], F. Monteiro[2], G. Almeida[2], T. Lamas[2], I. Simoes[2], I. Gaspar[2], M. Mendes[1], E. Carmo[2]

[1]*Hospital de Santa Cruz, Lisbon, Portugal;* [2]*Hospital Egas Moniz, Intensive Care Unit, Lisbon, Portugal*

Background: Care for the critically ill patient with Cardiovascular Disease (CVD) requires a unique management approach, as the theoretical critical threshold for decompensation is lower and inherent adaptive mechanisms may be compromised. We aimed to characterize the prognostic impact of CVD in patients admitted to an Intensive Care Unit (ICU).

Methods: We performed a cohort study of consecutive patients admitted to an ICU from January to December 2019. Patients were stratified as follows: (1) established CVD – presence of either atrial fibrillation, heart failure, coronary artery disease and/or peripheral artery disease; (2) at higher risk of CVD – known arterial hypertension, dyslipidemia, diabetes mellitus and/or current smoking, in the absence of established CVD; and (3) at lower risk of CVD – i.e. none of the above. The co-primary endpoints were all-cause death in ICU and death during index hospitalization.

Results: During 2019, there were 334 admissions in ICU, comprising a total of 296 patients (mean age 67 ± 15 years, 58.1% male). Overall, 69 (23.3%) and 108 (36.5%) died in ICU and during index hospitalization, respectively. Compared to patients at lower risk of CVD, those at higher CVD risk or with established CVD had markers of more severe disease, as noted by higher risk scores (e.g., SAPS-II 35.0 ± 20.0 vs. 43.5 ± 22.3 vs. 52.6 ± 20.0; $p < 0.001$), higher rates of mechanical ventilation (41.5 vs. 57.3 vs. 63.9%; $p=0.020$), shock during ICU stay (34.0 vs. 52.7 vs. 66.9%; $p < 0.001$) and acute kidney injury (26.4 vs. 35.5 vs. 57.9%; $p < 0.001$), respectively, as well as higher death rates in ICU (5.7 vs. 21.8 vs. 31.6%; $p=0.001$) and index hospitalization (9.4 vs. 37.3 vs. 46.6%; $p < 0.001$). In multivariate analysis, adjusted for age and cause of admission, established CVD independently predicted the risk of all-cause death in ICU (HR: 2.084; 95% CI: 1.136–3.823; $p=0.018$) and during index hospitalization (HR 1.712; CI: 1.009–2.889; $p=0.046$). The analysis for the group of patients at higher risk of CVD yielded similar results to the abovementioned.

Conclusion: Roughly 4 in every 5 patients admitted in ICU were at risk of or had established CVD. The presence of either of the above independently predicted a two- to three-fold higher risk of death during hospitalization. Our findings emphasize the considerable burden of CVD in ICU and underscore the importance of comprehensive management of the complex critically ill patient.

CV Risk groups in ICU