20295

Vasoactive inotropic score (VIS) at ICU admission predicts neurological outcome and survival in patients resuscitated from an out of hospital cardiac arrest

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Background: Since its proposal, Vasoactive Inotropic Score (VIS) was applied in different setting of acute critical care (e.g. pediatric population or post-cardiac surgery). It reflects the pharmacological support of the cardiovascular system and higher VIS values in the first 24 hours from ICU admission predict worse outcomes, both in pediatric and adult population. Few data are available regarding patients admitted for an Out of Hospital Cardiac Arrest (OHCA). The aim of this work is to investigate the prognostic role of VIS score in this population.

Methods: We enrolled 171 consecutive patients who were resuscitated after an OHCA and admitted to ICU at our center from September 2017 to April 2021. VIS score on admission was available for 144 patients. We divided the population in two groups (high vs low VIS score) according to VIS score median values. For every patient neurological outcome at discharge and survival at one year were available.

Results: Median VIS score was 10 so we considered low values $\leq$ 10 (group 1) and high values > 10 (group 2). There were 73 patients in low VIS group (Group 1) and 71 in high VIS group (Group 2). No differences were found in the two groups regarding sex (75% males vs 74%, p=0.88), age [64 (49-70) vs 61 (52-74), p=0.5], SAPS II score at admission [63.61 (53-70) vs 65.46 (61-86), p=0.54], shockable rhythm as first rhythm (60.2% vs 51.51%, p=0.3) and number of shocks delivered [median value 1 (0-13) vs 1 (0-14), p=0.84]. On the contrary, patients with lower VIS values had a shorter arrest duration [26 mins (19-40) vs 41 mins (27-74), p=0.0002] and less adrenaline delivered [2 mg (0-6) vs 3 mg (0 -12), p=0.0012]. Moreover, patients with lower VIS score values on admission showed a better neurological outcome (defined as a CPC < 2) at ICU discharge (44% vs 21%, p=0.08). In addition, patients in group 1 showed a lower mortality rate as compared to group 2 [60% (44/73) vs 76% (54/71),p=0.0048].

Conclusion: in adult patients resuscitated from an out-of-hospital cardiac arrest and admitted to an ICU, lower values of VIS score were associated with higher survival at 1 year. Moreover patients with low VIS showed better neurological outcome at ICU discharge. This could be explained by the fact that VIS express the need for cardiovascular support and is lower in patients with a more stable hemodynamic status after OHCA, reflecting a less compromised clinical condition.