Diagnostic value of post-return of spontaneous circulation electrocardiogram for selection of candidates for primary percutaneous coronary intervention after out-of-hospital cardiac arrest

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Background: Once return of spontaneous circulation (ROSC) is achieved in cardiac arrest (CA) patients (pts), guidelines recommend immediate acquisition of a 12-lead electrocardiogram (ECG) in order to try to identify those with underlying ischemic heart disease that would benefit from an emergent coronary angiography. Nevertheless, post-ROSC ECG findings may be influenced by factors such as drugs used during CPR (e.g., adrenaline) or metabolic state of pts (e.g., lactic acidosis) and therefore its diagnostic value for identification acute coronary lesions has not yet been established.

Objectives: To describe the correlation between post-ROSC ECG findings and acute coronary angiography lesions in out-of-hospital CA (OHCA) pts.

Methods: Retrospective analysis from a prospective database of pts admitted consecutively to the acute cardiac care unit of a tertiary care hospital from September 2006 to April 2019. Post-ROSC ECG of OHCA pts who underwent emergent coronary angiography were blindly and separately classified by 2 cardiologists as follows 1) ST-s elevation, 2) ST-s depression, 3) LBBB, 4) T wave changes/unespecific and 5) normal ECG. If discordant diagnosis, a senior cardiologist made a third and separate analysis. Additionally, coronary lesions were considered to be acute in presence of thrombi or unstable plaque (with or without complete occlusion).

Results: From 412 pts, 211 had an available and interpretable post-ROSC ECG and underwent emergent coronary angiography. Mean age 60±13 years, male sex 183 (86.7%). Correlation between ECG findings and acute coronary lesions are shown in table 1. Pts with ST-s elevation had an underlying acute coronary lesion in 55.2%. Moreover ST-s elevation had a positive predictive value of 84% and sensitivity of 58.8% for identifying acute coronary lesions. Other post-ROSC ECG findings did not significantly associate acute coronary lesions, in fact LBBB had a high negative predictive value for acute lesions.

Conclusion: Among post-ROSC ECG findings, ST-s elevation is significantly associated with acute coronary lesions and when identified, an invasive strategy should be considered as established by current practice guidelines. On the contrary, LBBB rarely associates acute coronary lesions at least in OHCA scenario and when its "new onset" is not specified.

ECG	Acute lesion n=125 (59.2 %)		p
	Yes	No	
ST- segment elevation	**69 (55.2%)**	56 (44.8%)	**<0.001**
ST-segment depression	15 (12%)	110 (88%)	0.18
LBBB	10 (8%)	**115 (92%)**	**<0.002**
T wave changes/Unespecific	78 (62.4%)	47 (37.6%)	0.45
Normal	2 (1.6%)	123 (98.4%)	0.09

ECG findings and acute coronary lesions