

## Post-ROSC electrocardiogram timing in the management of out-of-hospital cardiac arrest: results of an international multicentric study (PEACE study)

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**Background:** Electrocardiogram (ECG) is a key tool to triage out-of-hospital cardiac arrest (OHCA) patients after achieving a sustained return of spontaneous circulation (ROSC). According to current guidelines, an immediate coronary angiography is indicated only when the post-ROSC ECG discloses a ST-elevation myocardial infarction (STEMI). Moreover, the 12-lead ECG should be recorded as soon as possible after ROSC, although it is reasonable that in the early post-ROSC stages ECG could reflect the ischemia secondary to cardiac arrest besides that of coronary origin possibly causing an overdiagnosis of STEMI (false positive).

**Purpose:** To assess whether the time from ROSC to ECG acquisition could affect the percentage of false positive ECG for STEMI.

**Methods:** We performed a retrospective, international, multicenter study (PEACE Study - NCT04096079). We included all patients over 18 years of age hospitalized after an OHCA due to medical cause at one of the three participating high-volume hospitals of three different European countries between 2015, 1st January and 2018, 31st December. We considered for the present study only patients who underwent coronary angiography and in whom a post-ROSC ECG was available. For the electrocardiographic diagnosis of STEMI the criteria established by the ESC 2017 guidelines were used, while the execution of a percutaneous coronary angioplasty (PTCA) was evaluated as an angiographic endpoint. We used logistic regression to

evaluate the association of time to acquisition and the endpoint. We computed odds ratios and 95% confidence intervals (OR, 95% CI).

**Results:** Population consisted of 370 patients (77.6% male, mean age  $61 \pm 13$  years, median ROSC-ECG time 15 minutes). Post-ROSC ECG was positive for STEMI in 198 patients and in 39 of them (10.5%) a PTCA was not performed during urgent coronary angiography, representing the false positive (FP) ECG. Dividing the population in three tertiles according to the time from ROSC to ECG ( $\leq 7$  mins; 8–33 mins;  $>33$  mins), the percentage of FP-ECG in the first tertile (18.5%) was statistically significantly higher than in the second (7.2%, OR 2.9 (95% CI 1.1–7.5)  $p=0.025$ ) and third (5.8%, OR 3.7 (95% CI 2.2–6.5)  $p<0.001$ ) as also shown in the Figure. These differences remained significant when adjusting for sex, age, number of segments involved at ECG (anterior, lateral, posterior, inferior and right), QRS duration  $>120$  msec, ECG heart rate  $>100$  bpm and adrenaline administered  $>1$  mg.

**Conclusion:** Our study offers the first demonstration that the acquisition of the 12-leads ECG too early after ROSC can misleadingly lead to the diagnosis of STEMI. Despite further validation are required, our data suggest that it may be reasonable to delay the acquisition of the ECG at least 8 minutes after ROSC or to repeat the acquisition if the first ECG, resulting diagnostic for STEMI, was performed very early.

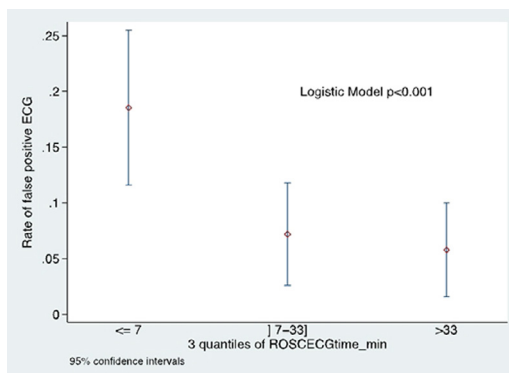


Figure 1