Outcomes of cardiopulmonary resuscitation in patients with complicated myocardial infarction at the prehospital level

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The aim The aim of the study was to analyse the outcomes of cardiopulmonary resuscitation (CPR) in patients with complicated myocardial infarction (MI) at the prehospital level.

Materials and methods

- The study was done at the Moscow A.S. Puchkov ambulance and emergency medical service.
- 455 emergency calls for MI were retrospectively and prospectively analysed in 2011-2015.
- Patients were split into two groups: MI with cardiac arrest [CA, n=184; split into successful CPR (n=79, 43%) and unsuccessful CPR (n=105, 57%)] and MI without CA (n=271).
- Analysis of MI and CPR outcomes was done. Barnard's exact test was used for the statistical analysis. Difference was considered significant at $P < 0.05$.

Results

CPR was significantly less successful in females [here and below – survived 38,6% vs. deceased 61,4%, $p=0,009$ - can be explained by the predominance of non-shockable rhythms (57,7% vs. 22,7%)], aged 60-80 y.o. (36,6% vs. 63,4%), onset of symptoms earlier than 3 hrs before ambulance arrival (32,9% vs. 67,2%), unstable angina for 3 days prior MI (29,6% vs. 70,4%), pain score 7-10 (28,9% vs. 71,1% - probable increase of the zone of myocardial necrosis).

CPR success rate was lower in ST elevation (42,3% vs. 57,7%), repeated MI (34,0% vs. 66%), anterior lesion (36,9% vs. 63,1%), in morphine administration (38,5% vs. 61,5%), pulmonary edema (19,2% vs. 80,8%), cardiogenic shock (34,5% vs. 65,5%) and their associations; unconsciousness (33,7% vs. 66,3%) or agitation (35,7% vs. 64,3%) on ambulance arrival.

Index	Successful CPR		Unsuccessful CPR		p-level
	n=79	%	n=105	%	
Whole group (n=184)	79	43	105	57	
Male (n=114)	52	45.6	62	54,4	0,245
Female (n=70)	27	38.6	43	61.4	0,009
60-80 y.o. (n=93)	34	36.6	59	63.4	0,0003
Pain score 7-10 (n=76)	22	28.9	54	71.1	0,0001
ST-elevation MI (n=149)	63	42.3	86	57.7	0,009
Non-ST-elevation MI (n=29)	11	37.9	18	62.1	0,087
Unstable angina (n=54)	16	29.6	38(54)	70.4	0,0001
Anterior MI (n=111)	41	36.9	70	63.1	0,0001
Morphine administration (n=96)	37	38.5	59	61.5	0,002
Pulmonary edema (n=52)	10	19.2	42	80.8	0,0001
Cardiogenic shock (n=119)	41	34.5	78	65.5	0,0001
Unconsciousness (n=95)	32	33.7	63	66.3	0,0001
Asystole (n=32)	9	28.1	23	71.9	0,001
PEA (n=46)	8	17.4	38	82.6	0,0001
Ventricular fibrillation (n=97)	57	58.8	40	41.2	0,018

Conclusions. CPR in patients with MI was minimally successful in the following cases: onset of MI symptoms earlier than 3 hours before ambulance arrival, unstable angina for three days prior MI, pulmonary edema and pulseless electrical activity.