Establishing the Crimean Out-of-Hospital Cardiac Arrest and Resuscitation Registry (COHCARR): a baseline epidemiological analysis

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Purpose of the study. To evaluate epidemiology of out-of-hospital cardiac arrest (OHCA) and performance of emergency medical services (EMS) in the Crimea.

Materials and methods. The Crimean Out-of-Hospital Cardiac Arrest and Resuscitation Registry (COHCARR) is designed as a prospective population-based registry of all EMS-attended OHCA with attempted resuscitation, occurring in the Republic of Crimea (population coverage: 1.91 million). The baseline data collected from January to June 2018 were analyzed descriptively following the Utstein methodology.

Results. A total of 6,391 OHCA were attended by EMS during the 6-month period, whereas resuscitation was commenced in 196 cases (3.1%). The incidence of OHCA with resuscitation attempted in the Republic of Crimea is calculated to be 20.5 per 100,000 population per year. The majority of OHCA patients were male (56%), median age – 65 years. OHCA mostly occurred at home (80%). Aetiology was considered to be medical in 92% cases. Most OHCA were witnessed by either the EMS (71%; n=139) or a bystander (24%; n=47). Out of the bystander-witnessed cases, resuscitation was initiated by a lay person in 19% (n=9). Shockable initial rhythm was registered in 16% OHCA. When excluding EMS-witnessed cases, mean EMS response time was 11 min, mean time to first defibrillation – 12 min, mean time to the first dose of adrenaline – 16 min. Thirteen patients (6.6%) gained return of spontaneous circulation (ROSC), and 5.6% had sustained ROSC until hospital admission. Out of 11 cases of bystander-witnessed OHCA with shockable initial rhythm, two patients (18%) achieved ROSC, and both survived to hospital arrival.

Conclusions. OHCA is a major health problem in the Crimea as evidenced by the high incidence, low rates of resuscitation commencement and dramatically low survival. The COHCARR would serve as a valuable tool for monitoring OHCA epidemiology and EMS performance, and prioritizing reasonable interventions to improve outcomes after OHCA.

Table. Key characteristics of OHCA with attempted CPR in the Republic of Crimea compared to the international data

OHCA characteristics	Republic of Crimea (current study)	27 European countries ^[1]	Ireland ^[2]	USA and Canada ^[3]	Japan ^[2]
Incidence of OHCA with attempted CPR (per 100,000 population-year)	21	49	39	n/d	n/d
Age, median (years)	65	70	67	66	76
Male (%)	56	66	67	63	58
Presumed medical aetiology (%)	92	91	86	95	85
Initial shockable rhythm (%)	16	22	24	22	8
EMS-witnessed OHCA (%)	71	12	6	12	7
Bystander-witnessed OHCA (%)	24	54	54	38	34
Bystander CPR (% of bystander-witnessed OHCA)	19	n/d	70	40	40
Any ROSC (%)	7	29	23	n/d	9
Survival on arrival at hospital (%)	6	25	17	n/d	n/d
Survival to hospital discharge/30 days (%)	n/d	10	6	10	5

Abbreviations: CPR – cardiopulmonary resuscitation, EMS – emergency medical service, OHCA – out-of-hospital cardiac arrest, ROSC – return of spontaneous circulation, n/d = no data.

References:
1) Gräsner JT, et al. Resuscitation. 2016;105: 188-195.
2) Masterson S, et al. Emerg Med J. 2016;33(11): 776-781.
3) Daya MR, et al. Resuscitation. 2015;91: 108-115.
4) Ong ME, et al. Resuscitation. 2015;96: 100-108.