

DANIEL CELIŃSKI

**Retrospective analysis of medical rescue teams departures
to patients with sudden cardiac arrest within the population involved
in the activity of Emergency Service in Siedlce
over the period of 2013 - 2016.**

ABSTRACT

1,032 cases of sudden cardiac arrest, where cardiopulmonary resuscitation was performed, were analysed. The study was conducted in Siedlce, in the region where Emergency Medical Services (EMS) provide care (Area 04-14) in 2013-2016. The region includes the area of six districts in eastern Mazowsze with a surface area of 7,176 m² and 495,000 inhabitants.

It was a retrospective study and the results were obtained from current medical documentation: the record of ambulance departures and the medical records of EMS rescue actions.

The effectiveness of emergency actions in patients with sudden cardiac arrest (SCA) was assessed. The resuscitation was considered successful when hemodynamically efficient heart rate returned and patients were transferred to hospitals. The influence of certain modifiable and unmodifiable factors on return of spontaneous circulation (ROSC) was studied.

In the whole study group, the efficiency of cardiopulmonary resuscitation (CPR) was 45.3%. The significant percentage of all patients were male (72%), while the return of heart rate was more frequently reported in female patients. The number of SCA increased with the age of patients; however, ROSC did not occur significantly often in any of the age groups. The largest group of patients who experienced SCA were patients over 75 years of age (n=281). The time of the day, when SCA occurred, had a significant impact on the efficacy of CPR (p=0.021). More cases of SCA and a higher number of successful resuscitation occurred around midday and in the afternoon. More specific data are presented in Figure 43, Table 15.

The most frequent place of cardiac arrest occurrence was within patient's home (n=835), definitely, much less frequently in public places (n=196). No relevant difference, as far as ROSC is concerned, was observed in these groups, even though the witnesses of incidences

performed first aid procedures definitely more often in public places in comparison to patient's home. The quality of first aid procedures, performed in these cases, was probably poor.

In the whole study group, time of an ambulance arrival to patients in ROSC group was relevantly, statistically shorter than in the group where spontaneous circulation did not return (mean 7.3 vs. 9.8 min). The average time of an ambulance arrival to emergency caller's location was relevantly shorter in towns with more than 10,000 inhabitants comparing to smaller ones – less than 10,000 inhabitants (mean 4.2 min. vs. 12.9 min.). This correlates with more frequent ROSC in patients who live in bigger cities.

Taking all patients into consideration, in patients with defibrillation rhythm or pulseless electrical activity (PEA), ROSC was observed significantly more frequently regarding the group of subjects in whom asystole was observed. ROSC was more frequent in patients who received oxygen therapy and were on respirator treatment, on the other hand, no correlation was observed between the implementation of intratracheal intubation and an increase in resuscitation efficacy. Administration of amiodarone also increased the chances to return spontaneous circulation.

Factors determining the survival rate of patients, which were studied from the 181 day after cardiac arrest, include the age of patient, the time of an ambulance crew arrival to emergency call location and the mechanism of sudden cardiac arrest. The highest percentage of survival over 180 days was reported within the group of age 21-35 yrs (40%, N=8) and 46-55 yrs (38.9%, N=14) ($p=0.000$). The prolonged time of emergency medical technicians arrival resulted in survival rate decline ($p=0.001$) with the exception of cases when the witnesses of an incidence performed Basic Life Support (BFS) before the arrival of an ambulance (Table 40). Significantly more cases of survival were reported in the group in which defibrillation was performed compared to the ones without defibrillation ($p=0.000$).

Executing the chain of survival is essential for effective cardiopulmonary resuscitation, provided that the continuity of taken actions is maintained. Constant society education and training in terms of BFS seems to be necessary.