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Evaluation of contributing factors to successful CPR following out-of-hospital cardiac arrest

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Introduction: Slovak Republic – central European country, population 5,435,343 peoples (2016). EMS providers: 273 ground ambulances, 7 HEMS, **Falck Emergency is a leading EMS provider in Slovakia**, 44% of ground ambulances and 180.000 cases per year. Approx. 148 cases of the cardiac arrest per 100.000 persons per year (by the EuReCa One study), or **76 CPR** per 100.000 every year. CRP with **ROSC** – approx. **22 %**, and hospital survival rate approx. 9% (by data from EuReCa).

Mapa staníc ZZS Falck Záchranná a.s.
4 oblasti, 10 regiónov

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1. Falck Emergency Slovakia coverage map

Aim: ERC Guidelines define **effective bystander BLS, high-quality chest compressions and early defibrillation** as the main **contributing factors** to improve **survival after cardiac arrest**. Falck Emergency Slovakia uses a Physio-Control software to abstract from defibrillator recordings and analyze parameters of the real CPR such as chest compressions and ventilation parameters. The aim of our study was to evaluate the abovementioned factors

influence on survival odds in patients after out-of-hospital cardiac arrest (OHCA).

2. CRP report from ground ambulance with a physician (initial rhythm ventricular fibrillation)

Methods: Authors analyzed **193 cases of shockable OHCA** where patients developed sustained return of spontaneous circulation (ROSC) and were transported to hospitals. The data were gathered from September 2015 till December 2017.

Authors focused on such parameters as bystander BLS, chest compressions ratio and rate, ETCO2 concentrations and time from OHCA confirmation to first shock. The **chest compressions ratio and rate and ETCO2 concentrations before ROSC** were chosen as the **indicators** of uninterrupted, **high-quality chest compressions**.

3. Parameters of success for ROSC and survival

Results: The median figures for the chosen parameters were the following: **compression ratio 85%, compression rate 111/min, pre-ROSC ETCO2 30 mmHg, time from OHCA confirmation to first shock 20.50 sec.** The average results for the compression parameters were the following: compression ratio $82.5 \pm 11\%$, compression rate $112 \pm 10/\text{min}$. Contraversively, 14.5% of the patients (n=28) had no bystander BLS.

Conclusion: Authors believe that the acquired figures of compressions ratio and rate and pre-ROSC ETCO2 could be considered as possible performance targets for high-quality chest compressions. Yet, a study needs to be fulfilled about relationships of the factors and long-term patient survival following OHCA.

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