

## **mgr Klaudiusz Andrzej Nadolny**

### **An analysis of activities and medical rescue actions in patients with circulatory-respiratory failure symptoms in the system of Emergency Medical Services**

#### **Abstract in English**

##### **Introduction**

Sudden cardiac arrest (SCA) is a significant medical and social issue, and the most important cause of death. SCA is the main cause of death in Europe and the USA. Bronchial asthma is a civilization disease. There are 300 million people in the world who suffer from this disease and 250 thousand fatal cases a year caused by asthma, while chronic obstructive pulmonary disease (COPD) is the most frequent chronic lung disease and one of the most frequent chronic diseases in Poland .

##### **Aim**

The aim is to analyze activities and medical rescue actions in patients with circulatory - respiratory failure symptoms in the system of Emergency Medical Services.

##### **Materials and methods**

The research covered dispatch order forms and emergency medical procedure forms of the Voivodship Rescue Service in Katowice in the years from 2014 to 2016. There were 750 872 such documents. The retrospective analysis covered only the cases of out-of-hospital sudden cardiac arrest in adults (1603 cases in 2016), bronchial asthma and COPD (5948 cases in the years 2014-2016). The statistical significance adopted for all analyses was 0.05.

##### **Results**

##### **Related to the SCA (sudden cardiac arrest)**

There have been 1603 dispatch cases included in the research. There were 1005 male patients (62.7%), 566 female patients (35.3%), and 32 cases (2.0%) with no gender reported. Women

were generally older ( $p = 0.000$ ). The average age of the group was 65.7 years. The attack rate amounted to 59.37/100 000. SCA most often occurred in domestic conditions (71.1%;  $p = 0.000$ ), usually in the presence of a witness (about 70.0%;  $p = 0.000$ ). Most of the SCA cases were reported in the first quarter of the year whereas the lowest number of cases was noticed in the third quarter (28.4% vs 22.5%). SCA was most common during the day. Restoration of spontaneous circulation was reported in 33.4% of the cases. Patients were usually intubated (51.4%). Respirators were used less often (20.2%). Ventricular fibrillation was reported in only 22.0% of the cases. ROSC rate was higher in the group of patients with diagnosed ventricular fibrillation than in the group of non-shockable rhythms (VF – 55.43% vs. asystole- 24.05%,  $p = 0.000$ ).

### **Related to bronchial asthma and COPD (chronic obstructive pulmonary disease)**

The analysis covered 57123 dispatch orders in the years 2014 and 2015. In the analyzed group, there were 2879 cases of diagnosed asthma, 1625 cases of COPD and 52619 cases of non-traumatic conditions. There were more men than women among patients with asthma and COPD ( $p < 0.001$ ). It was only in the group with non-traumatic conditions that women were a majority ( $p < 0.001$ ). The average age of the analyzed group was 54.56 years: the highest average age was observed in COPD (62.17 years) and the lowest in non-traumatic cases (54.16 years). Asthma and COPD cases were more often accompanied with teams that included doctors ( $p < 0.001$ ). The highest percentage of cardiac arrest cases was observed in patients with diagnosed COPD ( $p < 0.001$ ). There were also other advanced rescue procedures more often performed in the group of COPD patients. Atrial fibrillation also often accompanied COPD cases ( $p < 0.001$ ) as revealed on ECG.

### **Related to bronchial asthma**

There have been 2879 dispatch cases included in the research. Bronchial asthma is more frequent in women. The average age of patients under research was 56.21. The attack rate was 53.3/100 000. The most frequent dispatch destination was the patient's home (72.94%,  $p < 0.05$ ). The members of patients' families most often called emergency service (57.62%,  $p < 0.05$ ). Most of the interventions were reported in the first quarter of the year. Special medical emergency units (55.43 vs 44.56%,  $p < 0.05$ ) were dispatched more often than basic

units. There were some statistical differences reported that related with the emergency priority code ( $p < 0.05$ ). In most of the cases, there were no issues with the patients' skin. There were centralization of circulation symptoms in 81 cases. In most of the cases, the patient's breath was efficient (81.26%). The most common type of reported breath sound was wheezing (2230 cases, 77.45%).

### **Conclusions**

The incidence of emergency situations related to circulatory-respiratory failure is sporadic in the context of all interventions reported in the period under research. However, these less common cases are often unsuccessful. Performing actions in accordance with current knowledge may lead to a much higher survival rate and a better quality of patient's life. This is especially true for out-of-hospital cardiac arrest (OHCA).