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A descriptive study on sudden cardiac arrest based on OMOP CDM in Korea

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Abstract

To investigate the temporal trend of in-hospital mortality of sudden cardiac death, we analyzed an OMOP CDM database from a Korean single tertiary medical center. Total of 272 patients (men 63.2%) were diagnosed and treated for sudden cardiac arrest between 2003 and 2007. Overall in-hospital mortality was 36.0%. Further study using global data network based on OMOP CDM is been planning.

Introduction

Sudden cardiac arrest (SCA) is one of the treatable major cause of unexpected death worldwide. Survival rate from SCA can be serve as a representative indicator for the quality of public health system and emergency care system. Continuously, global in-hospital mortality after SCA is decreasing in developed countries owing to improved chain of survival, increased rate of by-stander cardiopulmonary resuscitation, and advanced post-resuscitation medical care such as therapeutic hypothermia¹.

We aimed to investigate the overall SCA incidence rate, survival rate, and post-resuscitation treatment pathway in medical care centers across the world. As a pilot study, we analyzed the trend in SCA incidence and mortality in a Korean tertiary hospital.

Methods

AUSOM, which was built in the form of OMOP common data model (CDM) from electronic health record of a single Korean tertiary teaching hospital, has 2.07 million patients' health records who visited from July 1994 to November 2014². From AUSOM database, person, condition occurrence, procedure occurrence, death, visit occurrence tables were used for analysis. In this study, SCA was defined in patients who were diagnosed with SCA during hospital visit through emergency department. The patients with previous history of SCA were excluded.

The overall demographics were calculated for age, gender, and hospital days for survivors. The in-hospital mortality and comorbidities were analyzed from January 2003 to December 2007.

Results

Overall, total of 272 patients (male 63.2%) were diagnosed and treated for SCA between 2003 and 2007. Mean ages were 59.3 and 57.8 years in men and women, respectively. Overall in-hospital mortality was 36.0%, which was greater in men compared to the mortality in women (38.4% vs. 32.0% in men and women respectively, $p < 0.001$)

The characteristics are shown in table 1. SCA occurred more in men than women. The major comorbidities of patients with SCA did not show obvious temporal trend, but the proportion of person who had ischemic heart disease seemed to be increased. The old patients (older than 60 years) were more than 50 % consistently. (**Table 1**) The in-hospital mortality rate was decreased over years (**Figure 1**).

Conclusion

The in-hospital mortality was decreasing in a Korean tertiary hospital as expected. For more accurate analysis about SCA and mortality by time and to find more valuable answer for the effect of treatment policies and emergency medical service on mortality after SCA, we're proposing further study which will use global data network and the Korean national health insurance data which covers all over the country for more than 10 years.

Table 1. Characteristics of sudden cardiac arrests in AUSOM from 2003 to 2007.

Characteristics	Year				
	2003	2004	2005	2006	2007
Total cohort population, n	149,696	150,088	158,218	169,401	192,599
SCA patients, n	57	44	44	58	69
Male (%)	68.4	56.8	68.2	60.3	62.3
Proportion by age (%)					
<20	7	11.4	6.8	3.4	5.8
20-39	10.5	11.4	18.2	10.3	10.1
40-59	22.8	27.3	20.5	17.2	31.9
≥60	59.6	50	54.5	69	52.2
In-hospital mortality (%)	49.12	40.91	40.91	27.59	26.09
Hospital days for survivors (days, mean ± SD)	6.26 ± 42.20	1.84 ± 11.29	19.86 ± 128.0	2.40 ± 13.27	17.52 ± 72.16
Comorbidity					
Ischemic heart disease (%)	14	6.8	20.5	15.5	15.9
Cerebrovascular accident (%)	1.8	13.6	6.8	3.4	5.8
Other brain disorder (%)	8.8	6.8	11.4	3.4	5.8

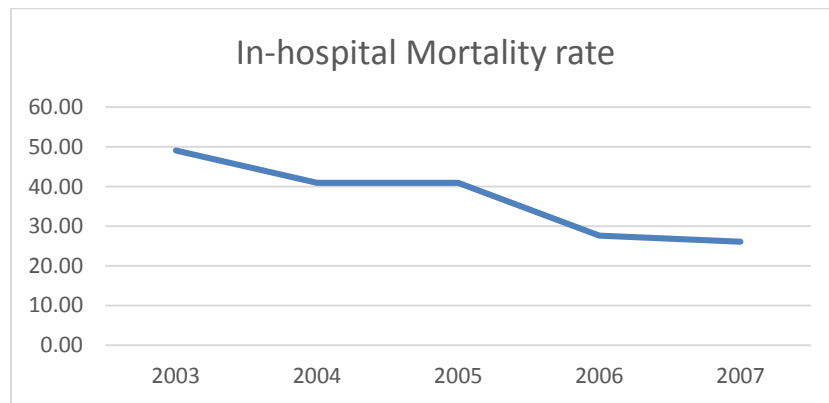


Figure 1. In-hospital mortality rate after diagnosing SCA for 5 years in AUSOM database.

References

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