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Seoul, Culture of Excellence

Bundle of Utstein CPR programs to achieve 2% survival re-increase



BRIEF BACKGROUND

Annually, more than 4,500 out-of-hospital cardiac arrests (OHCA) cases occur in Seoul. Seoul has been the region with the highest survival rate for OHCA in Korea, and the survival rate has continuously increased from 3.9% in 2006 to 9.2% in 2013. However, in 2014, the survival rate decreased to 8.6% for the first time. In 2015, the Seoul Fire Department implemented a bundle of Utstein cardiopulmonary resuscitation (CPR) programs to achieve a re-increase in survival. Because the almost 2% survival rate has increased every 2 years since 2006 in Seoul, a 2% survival re-increase during the next 2 years was aimed.

STEPS TAKEN

The Seoul Metropolitan Fire Department implemented the following bundle of three CPR programs among the Utstein ten-step CPR programs: 1) a high-quality dispatcher-assisted CPR program; 2) a multi-tier response program using fire engines or basic life support vehicles in addition to routine ambulance service, and 3) a feedback CPR program with professional recording and feedback on the CPR process using defibrillators with feedback function. During the program, it was continuously emphasized to all emergency medical service (EMS) providers that decreased survival of patients with OHCA in Seoul has occurred and the necessity and feasibility of a 2% re-increase in survival.

CHALLENGES

The leadership of a fire department is essential for rigorous quality control. Unfortunately, feedback CPR devices could not spread to all fire stations because of limited funding. In addition, because of the lack of an autonomous data collection system, the data collection and cleaning process for each feedback CPR device is time-consuming.

RESULTS

During the post-intervention period, the proportion of patients with OHCA who underwent the three types of CPR programs increased significantly compared with those in the pre-intervention period. The dispatcher-assisted CPR increased from 32.3% to 43.8%, multi-tier response increased from 0% to 57%, and feedback CPR increased from 25.5% to 78.1%. The survival-to-discharge rate was 9.8% in 2015 and 11.4% in 2016.

Temporal trend of CPR program and procedures

Category	2013		2014		2015		2016	
	H1	H2	H1	H2	H1	H2	H1	H2
Dispatcher-assisted CPR rate, %	32.3	26.9	44.6	46.6	43.9	45.5	44.1	43.8
Multi-tier response rate, %	0.0	0.0	0.0	0.0	9.6	40.2	46.6	57.0
Feedback CPR device penetration rate, %	25.5	27.8	25.9	25.9	42.8	59.9	67.7	78.1
EMS Resuscitation								
Median EMS scene time interval, min	8.0	8.0	7.0	7.0	9.0	11.0	12.0	12.0
Advanced airway management, %	7.8	10.6	15.1	15.9	27.1	43.4	53.0	61.4
Fluid resuscitation, %	2.4	4.7	5.6	5.3	12.5	23.7	37.4	48.9

OUTLOOK

The bundle of Utstein CPR programs transformed the new EMS CPR quality control program. Dispatcher-assisted CPR, multi-tier response, and feedback CPR continuously increased after the project. In addition to the changes in the three types of CPR programs, more advanced life support procedures and longer on-site CPR occurred. These changes were generated by the CPR programs (multilevel response and feedback CPR programs) added to this project. Clear goal setting with the implementation of Utstein ten-step CPR programs could improve the survival rate of patients with OHCA.

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