

Use of Emergency Medical Services: Experience 100 Days after First Case of COVID-19

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Background: The spread of the novel coronavirus 2019 (COVID-19), emergency medical services (EMS) work flow to be different from the normal situation such as avoid advanced airways management that perform aerosol generating. However, no studies examining EMS operation have been conducted at Srinagarind Hospital.

Objective: To compare EMS operation time and procedures during COVID-19 spreading and routine period.

Materials and Methods: This cross-sectional study examined all cases in which EMS were dispatched from Srinagarind Hospital during 13th January to 21st April 2020 compared with last year. Data were collected from the Srinagarind Hospital EMS operation database and hospital information database system.

Results: Five hundred forty-five EMS operations were examined. The mean age of the patients in 2020 was 50.4±6.2 years, and 70.9% (n = 195) were male. The average times from 1669 center call receipt to arrival on scene (response time) for 2019 and 2020 were 12.44±4.12 minutes and 7.32±2.40 minutes, respectively ($p = 0.016$). The nebulizer mask procedure was performed in 16.1% of cases in 2019 group compared with 7.1% in the 2020 group ($p < 0.001$).

Conclusion: COVID-19 pandemic in Thailand effect EMS operation in age group of patients, operation time, type of patients, response time and procedures in airway and breathing.

Keywords: COVID-19, Emergency medical services, Prehospital emergency care, Response time

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Emergency medical services (EMS) established to provide emergency patients care from scene to the hospital with healthcare providers of emergency medical responders (EMRs), emergency medical technicians (EMTs), advanced emergency medical technicians (AEMTs), paramedics, nurses, and doctors⁽¹⁻³⁾. In Thailand consist of four levels of operation team (advance, intermediate, basic and first responder team). Ground vehicles used include van and motorcycle based ambulance. The access to use of EMS via telephone number 1669^(4,5).

Since the spread of the novel coronavirus 2019 (COVID-19), EMS work flow to be different from the normal situation such as avoid advanced airways management that perform aerosol generating, use of mechanical

cardiopulmonary resuscitation device in cardiac arrest patients⁽⁶⁾, more elderly patients using the service⁽⁷⁾, high level of the personal protective equipment (PPE) for health professionals^(8,9). In the United States paramedic work within a National Scope of Practice Model which changes many procedures due to limited resources during COVID-19 spreading⁽¹⁰⁾ with all the changes during the short period of preparation for the situation⁽¹¹⁾ and many concern of healthcare provider in front-line affects professional decision⁽¹²⁾. However, there have yet been no studies regarding use of Thailand's EMS during COVID-19 spreading. Thus, this study was conducted to compare EMS operation time and procedure on ambulance.

Materials and Methods

This cross-sectional study examined all cases in which EMS were dispatched from Srinagarind Hospital during 13th January 2020 (Ministry of Public Health, Thailand announced the first confirmed case of COVID-19; Day1) to 21st April 2020 (Day 100) compared with normal situation service a year ago in the same period. Cases in which the patients were under 18 years of age or that had missing data were excluded from this study. Data were recorded using the operation national standard checklist for EMS in Thailand. Data were collected from the Srinagarind Hospital EMS operation database and hospital information database system. Ethics approval was provided by the Khon Kaen University

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Ethics Committee for Human Research (HE631253).

The sample size was calculated based on the number of Srinagarind Hospital EMS dispatched in 2019. In order to achieve a significance level of 5% and power of test of 0.8, we determined that a sample size of 545 would be required. Statistical analysis was performed using SPSS for Windows version 16.0 (SPSS Inc., Chicago, IL, USA). Categorical data were presented as percentages, and continuous data were presented using mean and standard deviation. Univariable analysis was performed using a two-sample t-test for numerical data and a Pearson's correlation for data relationship between the two groups.

Results

Five hundred forty-five EMS operations were examined over one hundred day of COVID-19 pandemic in Thailand compared with same period in 2019, 275 (50.5%) of which were service in 2020. The characteristics of the subjects and services are shown in Table 1. The mean age of the patients in 2020 was 50.4±6.2 years, and 70.9% (n = 195) were male. Operations in 2019 to 2020 were most commonly performed between afternoon shift (4.00 PM to 0.00 AM) 39.3% and 34.9% respectively. Non-trauma patients accounted for 68.9% and 80.0% of all cases in both year groups.

The average times from 1669 center call receipt to arrival on scene (response time) for 2019 and 2020 were 12.44±4.12 minutes and 7.32±2.40 minutes, respectively ($p = 0.016$; Table 2) and the average time between the responding ambulance arriving on location and when it departs with the patient to the emergency department (on scene time)⁽¹³⁾ were 2.22±1.40 minutes and 2.58±2.20 minutes, respectively.

Nasal cannula was the most common airway and breathing procedures on EMS. The nebulizer mask procedure was performed in 16.1% of cases in 2019 group compared with 7.1% in the 2020 group ($p < 0.001$). The laryngeal mask airway (LMA) was performed in 0.8% of cases in 2019 group compared with 11.9% in the 2020 group ($p < 0.001$; Table 3).

Discussion

In the present study, we examined data of EMS operation Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, Thailand from 13th January to 21st April 2020 compared same period of a year ago (2019). Based on the findings of the present study, EMS response time in 2020 significantly decrease from last year due to health policy of this period to emphasize people work at home and physical distancing resulting in decrease number of vehicles and traffic congestion which affect access times. The age of patients in EMS 2020 significantly more than last year related with previous study⁽⁷⁾ that in COVID-19 spreading geriatric patients difficultly in traveling to the hospital which the public transportation system was closed and there are many concerns about the outbreak, including need drugs that must be used regularly, so choose to use the EMS.

We also found that the operation time in night shift

Table 1. Characteristics of the subjects in 100 days

Characteristics	2019 (n = 270) n (%)	2020 (n = 275) n (%)	p-value
Age (years), mean ± SD	42.2±4.5	50.4±6.2	0.040*
Gender: male	184 (68.1)	195 (70.9)	0.586
Operation time			
Morning shift	102 (37.8)	94 (34.2)	0.589
Afternoon shift	106 (39.3)	96 (34.9)	0.596
Night shift	62 (22.9)	85 (30.9)	0.022*
Type of patients			0.028*
Non-trauma	186 (68.9)	220 (80.0)	
Trauma	84 (31.1)	55 (20.0)	

* Statistical significance

Table 2. Operation time in EMS

Operation time (min) mean ± SD	2019	2020	p-value
Response time	12.44±4.12	7.32±2.40	0.016*
On scene time	2.22±1.40	2.58±2.20	0.440

* Statistical significance

Table 3. Airway and breathing procedures on EMS

Procedures	2019 (n = 112) n (%)	2020 (n = 42) n (%)	p-value
Nasal cannula	70 (62.5)	23 (54.8)	0.224
Mask with bag	18 (16.1)	10 (23.8)	0.078
Nebulizer mask	18 (16.1)	3 (7.1)	<0.001*
Endotracheal intubation	5 (4.5)	1 (2.4)	0.082
Laryngeal mask airway	1 (0.8)	5 (11.9)	<0.001*

* Statistical significance

was significantly increase from normal situation due to Thai Government declared a State of Emergency on 24 March 2020 which prohibits people from leaving the house between 10.00 PM to 04.00 AM, causing people to use EMS to access the hospital. The number of trauma cases in EMS was significantly decrease due to low vehicle used on daytime and curfew in night time. The airway and breathing procedures on EMS were different from routine related with health policy^(6,8-11), we didn't use if not needed about nebulizer mask that's cause aerosol generating and encourage to use

LMA in advanced airway management.

The present study was limited that data were gathered from only one EMS center and the study design was retrospective, which may have resulted in incomplete data collection. The present study did not evaluate other procedure that may influence in EMS such as mechanical cardiopulmonary resuscitation device used⁽¹⁴⁻¹⁷⁾.

Conclusion

COVID-19 pandemic in Thailand effect EMS operation in age group of patients, operation time, type of patients, response time and procedures in airway and breathing.

What is already known on this topic?

EMS established to provide emergency patients care from scene to the hospital consist of four levels of operation team. The access to use of EMS via telephone number 1669.

What this study adds?

EMS response time in 2020 significantly decrease from last year due to health policy of this period to emphasize people work at home and physical distancing resulting in decrease number of vehicles and traffic congestion which affect access times.

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Conflicts of interest

The authors declare no conflict of interest.

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