

15 MINUTES OR LESS: DOES THE AMBULANCE RESPONSE TIME (ART) HAS IMPACT ON PATIENT'S OUTCOME?

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NMRR NO: 20-532-53831

Introduction

ART is a benchmark to measure the quality of Emergency Medical Services (EMS).

It is time interval when MECC receiving an emergency call to the arrival time of the ambulance at scene. According to the WHO, an ideal response time is equivalent to less than 8 minutes.

Different country has different response time. In Malaysia, the highlighted ART is less than 15 minutes for priority one cases in all states despite different settings and geographical status.

Methodology

This is a single centre, retrospective cohort study

conducted in Kota Bharu, Kelantan with a population of about 400,000 including various ages, gender, and race. Data from November 2019 to March 2020 was collected from MECC(Medical Emergency Medical Centre) database and SPP (*Sistem Pengurusan Pesakit*) HRPZII.

Patient Criteria Selection :

- Transport: Ambulance HRPZ II
- Destination : ED HRPZ II
- Age: 18 years and above
- Case: Priority 1420405035115

Data Analysis using IBM SPSS 25

Response times were compared to age, gender, race, comorbidity, chief complaint, triage, admission, length of stay, morbidity and mortality

Results

Table 1: Descriptive analysis of sociodemographic of patient by ART

Variable	n	ART, Frequency (%)	
		≤15 minutes (n, % = 141, 80.6%) 49.32 (21.27)	> 15 minutes (n, % = 34, 19.4%) 52.53 (22.04)
Age (years)*	175		
Gender			
Male	104	84 (59.6)	20 (58.5)
Female	71	57 (40.4)	14 (41.4)
Race			
Malay	157	128 (90.8)	29 (85.3)
Siamese	5	4 (2.8)	1 (2.9)
Chinese	12	9 (6.4)	3 (8.8)
Others	1	0 (0.0)	1 (2.9)
Residence			
Urban	174	141 (100.0)	33 (97.1)
Rural	1	0 (0.0)	1 (2.9)
Hypertension			
Yes	64	52 (36.9)	12 (35.3)
No	111	89 (63.1)	22 (64.7)
Diabetes mellitus			
Yes	52	42 (29.8)	10 (29.4)
No	123	99 (70.2)	24 (70.6)
Heart disease			
Yes	28	21 (14.9)	7 (20.6)
No	147	120 (85.1)	27 (79.4)
Chronic kidney disease			
Yes	17	14 (9.9)	3 (8.8)
No	158	127 (90.1)	31 (91.2)
Lung disease			
Yes	13	8 (5.7)	5 (14.7)
No	162	133 (94.3)	29 (85.3)

Table 1: Continue

Variable	n	ART, Frequency (%)	
		≤15 minutes (n, % = 141, 80.6%) 49.32 (21.27)	> 15 minutes (n, % = 34, 19.4%) 52.53 (22.04)
CVA			
Yes	22	16 (11.3)	6 (17.6)
No	153	125 (88.7)	28 (82.4)
Other comorbid			
Yes	22	17 (12.1)	5 (14.7)
No	153	124 (87.9)	29 (85.3)
Complain			
Medical problem	105	81 (57.4)	24 (70.6)
Surgical problem	4	3 (2.1)	1 (2.9)
MVA/Trauma	66	57 (40.4)	9 (26.5)
Triage			
Green zone	23	21 (14.9)	2 (5.9)
Yellow zone	99	77 (54.6)	22 (64.7)
Red zone	53	43 (30.5)	10 (29.4)
Admission			
Yes	96	75 (53.2)	21 (61.8)
No	79	66 (46.8)	13 (38.2)
Length of stay (days)**	96	4.00 (5.00)	4.00 (4.00)
Morbidity			
None	153	123 (87.2)	30 (88.2)
Intubation	10	9 (6.4)	1 (2.9)
Operation	1	1 (0.7)	0 (0.0)
ICU	3	2 (1.4)	1 (2.9)
Intubation and ICU	7	5 (3.5)	2 (5.9)
Intubation and operation	1	1 (0.7)	0 (0.0)
Mortality			
Alive	158	128 (90.8)	30 (88.2)
Dead	17	13 (9.2)	4 (11.8)

*Mean (SD)
**Median (IQR)
* Length of stay for patients with Admission (Yes): ≤15 minutes (n=75), >15 minutes (n=21)

Table 2: Effect of ART to the length of stay by Mann-Whitney test

Variable	Median (IQR)		z-statistic	p-value
	≤15 minutes (n = 75)	>15 minutes (n = 21)		
Length of stay	4.00 (5.00)	4.00 (4.00)	-0.018	>0.95

*Normality distribution of each ART group assumption for Independent t-test was violated

Table 3: Association between ART with mortality status and morbidity of patients

Variable	ART, frequency (%)		n	p-value
	≤15 minutes (n=141)	>15 minutes (n=34)		
Mortality				
Alive	128 (90.8)	30 (88.2)	158	0.746
Dead	13 (9.2)	4 (11.8)	17	
Morbidity				
None	123 (87.2)	30 (88.2)	153	0.749
Intubation	9 (6.4)	1 (2.9)	10	
Operation	1 (0.7)	0 (0.0)	1	
ICU	2 (1.4)	1 (2.9)	3	
Intubation and ICU	5 (3.5)	2 (5.9)	7	
Intubation and operation	1 (0.7)	0 (0.0)	1	

*Expected count of less than 5 was more than 20%; Fisher's exact test was applied

Discussions

There is discrepancies between patient symptoms reported by caller and clinical triage by paramedic upon patient encounter resulting in "not true Priority One" cases . Need for re-evaluating of the triage system since different management given for different group of priority lead to different outcome .

Our study focus on one ambulance response time only. There are other variables need to be examined such as **traffic flow, weather, timing of the service, condition at the scene and emergency department.**

Limitations

Study done in a single centre

Study done retrospectively and in short period of time

Conclusion

There is **NO SIGNIFICANT** correlation between ART less or equal to 15 minutes with patient outcomes

Reference

