THE EFFECT OF COMPOSITIONS OF EMERGENCY MEDICAL TECHNICIAN TEAMS ON THE OUTCOMES OF PATIENTS WITH OUT-OF-HOSPITAL CARDIAC ARRESTS

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Background

- Emergency medical technicians (EMTs) as a team provide prehospital care for patients with out-of-hospital cardiac arrest (OHCA). EMT-paramedics (EMT-Ps) could provide advance life supports for OHCA. However, the evidence regarding the effect of compositions of EMT teams on the outcome of OHCA is insufficient.

Methods and Materials

- A retrospective cohort of non-traumatic adults with OHCA from January 2014 to December 2016 in Tainan, Taiwan was established. The outcomes included ever return of spontaneous circulation (ROSC), a sustained (≥ 20 min) ROSC, and a 24-hour ROSC. The EMT-P ratio was defined as the proportion of the EMT-P number among all of the EMT team. A multivariate regression was examined to overcome the confounding factors linked to the impact of EMT-P ratio.

Results

- Of 1,405 OHCA, those having ever ROSC, a sustained ROSC, or a 24-hour ROSC accounted for 27.8% (391 patients), 26.3% (370), or 20.4% (286), respectively. The EMT-P ratio was striated as four groups: 0-33%,

Variable	ROSC		Sustained ROSC		24hour ROSC	
	Univariate	Multivariate	Univariate	Multivariate	Univariate	Multivariate
The elderly, ≥ 65 years	0.63 (0.49 – 0.79)*	0.66 (0.52 – 0.85)*	0.58 (0.46 – 0.74)*	0.61 (0.47 – 0.79)	0.51 (0.40 – 0.67)*	0.53 (0.40 – 0.70)*
EMS response time ≤ 8 min	–	–	–	–	1.45 (1.01 – 2.09)*	0.74 (0.51 – 1.09)
EMS transfer time ≤ 8 min	–	–	–	–	1.42 (1.02 – 1.99)*	0.78 (0.54 – 1.12)
Indoor location of arrest	0.55 (0.38 – 0.75)*	0.67 (0.45 – 0.98)*	0.55 (0.38 – 0.80)*	0.69 (0.47 – 1.02)	0.57 (0.38 – 0.84)*	0.70 (0.46 – 1.07)
Transfer to medical center	–	–	–	–	1.35 (1.04 – 1.76)*	1.36 (1.03 – 1.78)*
DC shock in EMT	2.21 (1.66 – 2.95)*	1.86 (1.38 – 2.52)*	2.23 (1.67 – 2.99)*	1.85 (1.37 – 2.52)*	2.29 (1.68 -3.11)*	1.95 (1.40 – 2.70)*
Comorbidities						
Diabetes mellitus	0.72 (0.56 – 0.92)*	0.70 (0.53 – 0.91)*	0.72 (0.56 – 0.93)*	0.71 (0.53 – 0.93)*	0.67 (0.51 – 0.89)	0.64 (0.47 – 0.86)*
Cardiovascular disease	0.75 (0.57 -0.97)*	0.81 (0.61 – 1.07)	0.74 (0.56 – 0.96)*	0.79 (0.59 – 1.05)	0.73 (0.55 – 0.98)	0.79 (0.58 – 1.08)
Chronic kidney disease	0.71 (0.51 – 0.99)*	0.88 (0.62 – 1.25)	0.69 (0.49 – 0.96)*	0.85 (0.60 – 1.22)	–	–
TP ratio						
0 – 33.3%	0.80 (0.53 – 1.20)	1 <reference>	0.76 (0.50 – 1.16)	1 <reference>	0.74 (0.46 – 1.17)	1 <reference>
50%	0.70 (0.56 – 0.89)*	1.52 (0.99 – 2.36)	0.70 (0.55 – 0.89)*	1.63 (1.04 – 2.55)*	0.81 (0.62 – 1.05)	1.36 (0.81 – 2.28)
66.7 – 75.0%	1.16 (0.75 – 1.80)	1.45 (1.11 – 1.89)*	1.14 (0.73 – 1.78)	1.46 (1.12 – 1.91)*	1.32 (0.82 – 2.11)	1.06 (0.78 – 1.45)
100%	1.50 (1.18 – 1.90)*	1.06 (0.66 – 1.70)	1.53 (1.20 – 1.96)*	1.09 (0.68 -1.77)	1.28 (0.98 – 1.67)	0.83 (0.49- 1.38)

142 patients; 50%, 648; 66.7–75.0%, 101; and 100%, 514. A significant positive trend of ever ROSC, a sustained ROSC, or a 24-hour ROSC was evidenced (all $r=1.00$, $P=0.01$), as the EMT-P ratio increased. In the multivariate regression, a significant beneficial influence of the EMT-P ratio group of 66.7-75.0% on ever ROSC was observed (adjusted hazard ratio [aHR], 1.45; 95% confidence interval [CI], 1.11-1.89), compared to the group of 0-33%. A significant beneficial influence of the EMT-P ratio group of 50% (aHR, 1.63; 95% C.I., 1.04-2.55) or that of 66.7-75.0% (aHR, 1.46; 95% C.I., 1.12-1.91) on the sustained ROSC was observed, compared to the group of 0-33%.

Conclusions

- The increased EMT-P ratio was independently associated with the higher proportion of ever ROSC and a sustained ROSC. EMT-P training programs could be promoted to better the outcomes of OHCA.
- Keywords:** emergency-medical-technicians-paramedic; return of spontaneous circulation; out of hospital cardiac arrest.