Body mass index may be associated with outcomes in patients successfully resuscitated from cardiogenic arrest: a multi-center study

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BACKGROUND & AIM

The role of body mass index (BMI) on clinical outcomes in patients resuscitated from cardiac arrest has drawn attention recently. However, influence of obesity on clinical outcomes of patients underwent cardiac arrest is still controversial. This study is to investigate the association between BMI and outcomes in cardiac survivors.

METHODS

The retrospective cohort study recruited 273 non-traumatic adult cardiac arrest survivors who received emergent coronary angiography (CAG) after return of spontaneous circulation (ROSC) in three hospitals from January 2011 to September 2017. The enrolled patients were divided into the underweight, normal, overweight and obese groups based on BMI (underweight: BMI < 18.5; normal: 18.5-24.9; overweight: 25.0-29.9; obese≥30). The neurological recovery was assessed by cerebral performance scale (CPC). The in-hospital mortality and poor neurological outcome were compared between different BMI groups.

RESULTS

There were 13 (4.8%) patients in the under-weight group, 121 (44.3%) patients in the normal-weight group, 100 (36.6%) patients in the over-weight group and 39 (14.3%) patients in the obese group. The obese group had significantly higher rates of in-hospital mortality and poor neurological outcome (CPC = 3~5) as compared to the other 3 groups (in-hospital mortality: underweight 38.5%, normal: 29.8%, overweight: 39.0%, obese: 64.1%, $p=0.002$; poor neurological outcome: underweight 53.9%, normal: 43.8%, over-weight: 47.0%, obese: 71.8%, $p = 0.02$). Compared with the normal weight group, the obese group presented with higher risk for in-hospital mortality and poor neurological outcome (in-hospital mortality: adjusted HR=5.24, 95% CI 2.30–11.92, $p < 0.001$; poor neurological outcome: adjusted HR=3.84, 95% CI 1.68–8.78, $p = 0.001$).

FIG 1. PATIENT SELECTION

TABLE 1. BASELINE CHARACTERISTICS

n (%)	Body mass index					p
	total patients	underweight < 18.5	normal 18.5–24.9	overweight 25.0–29.9	obesity≥30	
Age (years)	60.84±13.27	65.74±16.31	61.00±13.75	61.33±12.08	57.46±13.39	0.217
Gender (Male)	208 (76.19%)	10 (76.92%)	89 (73.55%)	77 (77.00%)	32 (82.05%)	0.743
Smoking	68 (24.91%)	3 (23.08%)	29 (23.97%)	25 (25.00%)	11 (28.21%)	0.959
Hypertension	154 (56.41%)	6 (46.15%)	60 (49.59%)	63 (63.00%)	25 (64.10%)	0.136
Diabetes mellitus	108 (39.56%)	1 (7.69%)	46 (38.02%)	42 (42.00%)	19 (48.72%)	0.044
Dyslipidemia	57 (20.88%)	3 (23.08%)	30 (24.79%)	18 (18.00%)	6 (15.38%)	0.498
Coronary artery disease	97 (35.53%)	4 (30.77%)	39 (32.23%)	37 (37.00%)	17 (43.59%)	0.593
Chronic kidney disease	49 (17.95%)	0 (0.00%)	21 (17.36%)	20 (20.00%)	8 (20.51%)	0.343
Witnessed collapse	222 (81.92%)	11 (84.62%)	103 (85.83%)	81 (81.00%)	27 (69.23%)	0.136
Bystander CPR	199 (73.43%)	8 (61.54%)	89 (74.17%)	76 (76.00%)	26 (66.67%)	0.483
Initial shockable rhythm	114 (41.76%)	4 (30.77%)	54 (44.63%)	43 (43.00%)	13 (33.33%)	0.489
Shockable rhythm ever	169 (62.13%)	9 (69.23%)	78 (65.00%)	60 (60.00%)	22 (56.41%)	0.697
Heart rate at ROSC (BPM)	101±26	98±22	102±25	98±29	107±23	0.289
Inotrope use	204 (75.56%)	8 (61.54%)	84 (71.19%)	75 (75.00%)	37 (94.87%)	0.012
Therapeutic hypothermia	98 (39.84%)	5 (38.46%)	51 (46.36%)	30 (30.00%)	12 (35.29%)	0.301
Dual anti-platelet agents	199 (73.70%)	8 (61.54%)	85 (71.43%)	76 (76.00%)	30 (76.92%)	0.573

TABLE 2. INHOSPITAL MORTALITY & NEUROLOGICAL OUTCOME

	In-hospital mortality	Adjusted HR (95% CI)	p	Poor neurological outcome	Adjusted HR (95% CI)	p
underweight < 18.5	5 (4.76%)	1.17 (0.35, 3.97)	0.799	7 (5.19%)	1.23 (0.38, 3.99)	0.733
normal 18.5–24.9	36 (34.29%)	Reference		53 (39.26%)	Reference	
overweight 25.0–29.9	39 (37.14%)	1.55 (1.01, 2.76)	0.043	47 (44.76%)	1.15 (0.66, 1.98)	0.626
Obesity ≥ 30	25 (23.81%)	5.24 (2.30, 11.92)	< 0.001	28 (20.74%)	3.84 (1.68, 8.78)	0.001

FIG 2. SURVIVAL CURVES IN BMI GROUPS

CONCLUSIONS

In patients with cardiogenic arrest, the obese BMI was associated with increased risk for in-hospital mortality and poor neurological recovery.