The association between cardiopulmonary resuscitation in out-of-hospital settings and chest injuries: a retrospective observational study

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INTRODUCTION

*Few reports have focused on **out-of-hospital CPR** separately and evaluated the association between out-of-hospital CPR and the risk of adverse events.*

We aimed to assess the risk of chest injuries caused by cardiopulmonary resuscitation (CPR) in patients with out-of-hospital cardiac arrest (OHCA).

MATERIAL & METHOD

- ✱ Retrospective, single-center patient report study including all patients with non-traumatic OHCA patients between 2013 to 2016.
- ✱ A multivariate logistic regression analysis was performed to assess the **independent risk factors for chest injuries related to CPR**.
- ✱ The adjusted odds ratios for the incidence of chest injuries were assessed in patients stratified by out-of-hospital CPR duration to evaluate the point of increased risk of injury.

RESULT

	With chest injuries (n=233)	Without chest injuries (n=239)
Age,year (SD)	77.6 (11.3)	66.4 (16.5)
Sex (Female), n(%)	98 (42.2%)	83 (34.6%)
Witness, n(%)	80 (34.5%)	100 (41.7%)
Bystander, n(%)	103 (44.4%)	101 (42.1%)
In-hospital CPR ,min(SD)	19.2 (14.3)	16.7 (15.1)
Out-of-hospital CPR ,min(SD)	25.9 (10.0)	22.6 (10.5)
Total CPR time,min(SD)	45.1 (18.0)	39.2 (20.6)
ROSC, n(%)	76 (31.5%)	128 (55.4%)
Survived, n(%)	10 (4.15%)	30 (13.0%)

The baseline characteristics of patients stratified by the presence or absence of chest injuries caused by CPR

	Adjusted odds ratio [95% confidence interval]	p value
Age	1.06 [1.04 to 1.07]	< 0.001
Female	1.14 [0.76 to 1.72]	0.52
Bystander	1.09 [0.73 to 1.63]	0.67
IHCPR duration	1.02 [0.99 to 1.05]	0.07
OH CPR duration	1.03 [1.01 to 1.05]	0.01

Multivariate logistic analysis for the relation to chest injuries

The relationship between the cumulative number of patients with chest injuries and out-of-hospital CPR duration

The odds ratios for the incidence of chest injuries stratified by 5-minute increments of out-of-hospital CPR

CONCLUSION

✱ **Long duration of out-of-hospital CPR** (, not a duration of in-hospital CPR) was an independent risk factor for chest injuries, possibly due to the difficulty of maintaining CPR quality.

✱ It might be feasible to use a device such as an automated chest compressor to overcome **unstable conditions during transport** in cases requiring long transportation times.