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Introduction:
Quality of chest compressions (CCs) before emergency medical service (EMS) arrival in addition to prehospital advanced life support (ALS) after EMS arrival may influence the outcomes of out-of-hospital cardiac arrest (OHCA).

Methods:
In this prospective study of 4,253 OHCA s that received bystander-performed CCs between October 2010 and December 2016, CC quality was determined in 3,759 cases by EMS personnel on their arrival at the scene. Stepwise multivariable analyses that included interaction between time of day and arrest location were performed in a stepwise manner.

Results:
Prehospital ALS (adjusted OR, 1.63; 95%CI, 1.38-1.93) but not good-quality of bystander-performed CCs (1.02, 0.84-1.26) was associated with sustained return of circulation (ROSC). Neither provision of good-quality CCs nor prehospital ALS was a major factor associated with on-month survival. However, good-quality of bystander-performed CCs (2.44, 1.81-5.00) in addition to shockable rhythm (13.3; 8.70-20.4) and bystander-witnessed OHCA (4.79; 2.98-8.00) were associated with higher chances of neurologically favourable one-year survival, whereas prehospital ALS (0.21; 0.10-0.39) and elderly OHCA (0.47; 0.31-0.73) were associated with lower chances of the survival (Fig). The impact of good quality CCs on survival were preserved in bystander-witnessed OHCA s with shockable initial rhythm. Non-central region (adjusted OR for good-quality, 0.46; 95%CI, 0.39-0.54), lack of BLS training experience (0.47; 0.36-0.62), elderly-only rescuers (0.53; 0.44-0.65), CC initiation following dispatcher-assisted cardiopulmonary resuscitation (0.71; 0.55-0.91), and female-only rescuer (0.77; 0.65-0.90) were associated with poor-quality CCs. CC quality in at-home OHCA s remained low throughout the day, whereas that in out-of-home OHCA s decreased during night-time.

Conclusion:
Provision of good-quality CCs before EMS arrival but not prehospital ALS was essential for neurologically favourable survival.
Fig. Major factors associated with good-quality bystander-performed chest compressions