

Oral presentation

Performance of automated external defibrillator in moving ambulance vehicles

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Introduction

Current resuscitation guideline recommends that automated external defibrillator (AED) should never be placed in the analysis mode during transport because the movement of the vehicle can interfere with rhythm assessment. To date, no direct comparison of the AED performance at the scene and in a moving ambulance has been made. The aim of this study was to determine the intensity of vibration in a moving ambulance and to evaluate the influence of movements during transport on AED performance.

Methods

An ambulance was driven on paved (20 to 100 km/h) and unpaved roads (10 km/h). The movements while driving were measured using a vibrometer. AED (CU ER 2, CU Medical Systems Inc., Korea, Heartstart MRx, Phillips, USA) performances were determined in the moving ambulance with manikins (Resusci Anne CPR-D, ALS simulator, Laerdal, Norway). They were determined again using manikins and domestic pigs under experimentally induced vibration (0.5–5 m/s²).

Results

The intensity of vibration increased with speeding up on paved road (0.34 ± 0.40 m/s² at 20 km/h – 1.58 ± 0.44 m/s² at 100 km/h). On unpaved road, it increased to 6.00 ± 1.06 m/s². With Resusci Anne CPR-D, the movements did not affect AED performances. With ALS simulator, sinus rhythm was correctly analyzed irrespective of driving condition. However, VF was correctly analyzed while driving

on paved road. Both AED exhibited 74 and 92% sensitivity while driving on unpaved road, respectively. HeartStart MRx correctly analyzed asystole while driving on paved road. It exhibited 58% specificity while driving on unpaved road. CU ER 2 exhibited degraded specificity even during driving on paved road. On manikins, AED performances under induced vibration corresponding to each driving condition were similar to those in moving ambulance, but not on pigs.

Conclusion

At present, it seems reasonable to suggest that AED should never be placed in the analysis mode during transport.