

## **Title**

### **First-attempt success rate using direct or video laryngoscopy during cardiopulmonary resuscitation: A secondary analysis of a multicenter study**

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## Abstract

The advantage of video laryngoscopy (VL) over direct laryngoscopy (DL) for endotracheal intubations (ETIs) during cardiopulmonary resuscitation (CPR) has not been fully established. In this context, we sought to compare the first-pass success rate of ETIs between VL and DL during CPR by using multi-center data. This study is the secondary analysis of the data from a prospective, multicenter study of 15 Emergency Departments (EDs) in Japan (the Japanese Emergency Airway Network-2 study). From February 2012 to November 2016, all adult patients with cardiac arrest who underwent ETIs in the EDs were included for the analysis. Patients who underwent ETIs using other intubation devices were excluded. The primary exposure was ETIs with VL (C-MAC<sup>®</sup>, Airway scope<sup>®</sup>, McGrath<sup>®</sup>, Glidescope<sup>®</sup>) or DL. The primary outcome was first-pass success rate. The secondary outcomes were glottic visualization assessed with Cormack grade (1 vs. 2-4) and the rate of esophageal intubation. We evaluated the association between VL and outcomes using the multivariate analysis adjusting for age, gender, body mass index, indication for intubation, difficulty of intubation score (modified LEMON score), and specialty of the intubator.

Among 3,156 patients with cardiac arrest, 3,005 patients (38%) were included in the analysis. The primary cause of cardiac arrest was medical arrest in 2,707 patients (90%). The first ETI was performed with VL in 452 patients (15%) and with DL in 2,533 patients (85%). The first-pass success rate was 76% (95%CI 72%-80%) in the VL group and 70% (95%CI 68%-72%) in the DL group. In the multivariate analysis, the first-pass success rates were not significantly different between the VL and DL groups (adjusted OR, 1.04; [95% CI, 0.76-1.42];  $p = 0.65$ ). In terms of visualization, VL was associated with a better glottic visualization

(adjusted OR, 3.20; [95% CI, 2.47-4.14];  $p < 0.001$ ). The rate of esophageal intubation did not differ between the two groups (adjusted OR, 0.55; [95% CI, 0.26-1.16];  $p = 0.12$ ).

By using a large multicenter prospective study of ED patients among patients with cardiac arrest, we found that the first-pass success rate was not statistically different between the VL and DL groups despite the improved Cormack grade with the use of VL.