Comparison of videolaryngoscopy and direct laryngoscopy by paramedics during out of hospital CPR An observational prospective study

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Purpose of the study:

Although videolaryngoscopy (VL) may facilitate intubation in rescuers with low experience there is limited data available concerning endotracheal intubation performed by paramedics during out of hospital CPR. The goal of this trial was to investigate endotracheal intubation during CPR performed by non-physicians in a single emergency department in Germany.

Materials and methods:

We investigated in an observational prospective study the efficacy of VL during CPR compared to conventional direct laryngoscopy (DL) performed by paramedics. After approval by local ethics committee, we instructed and equipped paramedics of four ambulances in endotracheal intubation with GlideScope® (GVL). In cases without presence of an EMS physician on scene intubation should be performed either with GVL or with DL. A maximum of two attempts were allowed per protocol. Primary endpoint was good visibility of the glottis (Cormack Lehane grading 1/2), secondary endpoint successful intubation.

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Results Part I:

In total n=97 patients could be included, n= 69 using direct laryngoscopy (with n=85 intubation attempts) and n=28 using videolaryngoscopy (with n=37 intubation attempts). Laryngoscopy with GVL resulted in a significantly improved visualization of the larynx compared to DL. In the group using GVL 82% rated visualization of the glottis as CL 1&2 versus 55% in the DL group (p=0.02). Despite better visualization of the larynx there was no statistical significant difference in successful endotracheal intubation between videolaryngoscopy and direct laryngoscopy (GVL 75% vs. DL 68%, p =0.63). In addition, more attempts for the successful endotracheal intubation were needed in the GVL group.

Table 1. Comparison View of the Larynx by Cormack-Lehane Classification System: Videolaryngoscopy (GVL) vs. Direct Laryngoscopy (DL)

Dichotomized CL-Grade	GVL	DL	P-value
I+II (easier ETI)	23 (82.15%)	38 (55.7%)	0.02
III+IV (difficult ETI)	5 (17.85%)	31 (44.93%)	0.02

CL-Grade	GVL	DL	P-value
I	11 (39.29%)	8 (11.59%)	0.004
II	12 (42.86%)	30 (43.48%)	1
III	3 (10.71%)	20 (28.99%)	0.07
IV	2 (7.14%)	11 (15.94%)	0.34

Results Part II:

Table 2. Comparison of Overall Successful Endotracheal Intubation (ETI)

	ETI successful		ETI unsuccessful
GVL	21 (75%)	7 (25%)	28
DL	47 (68.1%)	22 (31.9%)	69
	68	29	97
Fisher's exact test two-tailed P-value is 0.626777			

Conclusions:

When used by paramedics during CPR GVL leads to better visibility of the glottis, but did not increase the number of successful initial intubation attempts. Therefore, we conclude that education in videolaryngoscopy should also focus on the insertion of the endotracheal tube.