Effect of Early Supraglottic Airway Device Insertion on Chest Compression Fraction during Simulated Out-of-Hospital Cardiac Arrest: Randomised Controlled Trial

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BACKGROUND

The optimal airway management strategy for out-of-hospital cardiac arrest is still debated. Early insertion of a supraglottic airway device might represent an adequate solution, as it allows continuous chest compressions. This could improve the chest compression fraction (CCF), a key determinant on survival and favourable neurological outcome in OHCA.

OBJECTIVES

The primary aim was to determine whether the insertion of an i-gel® while providing continuous chest compressions, with asynchronous ventilations allows higher CCFs than the 30 compressions : 2 bag-valve-mask ventilations scheme in a simulated OHCA.

The secondary aims was to assess the learning path in the naive population, and to assess CPR quality and ventilation parameters.

METHODS

A multicentre, parallel, randomised, superiority, 10-minute simulation study was conducted. The primary outcome was the difference in CCF during the first two minutes of resuscitation. Overall and per-cycle CCF, quality of chest compressions and ventilation parameters were also compared. The experimental approach was taught by video (see QR code in footer) after a 10-minute workshop on i-gel® insertion.

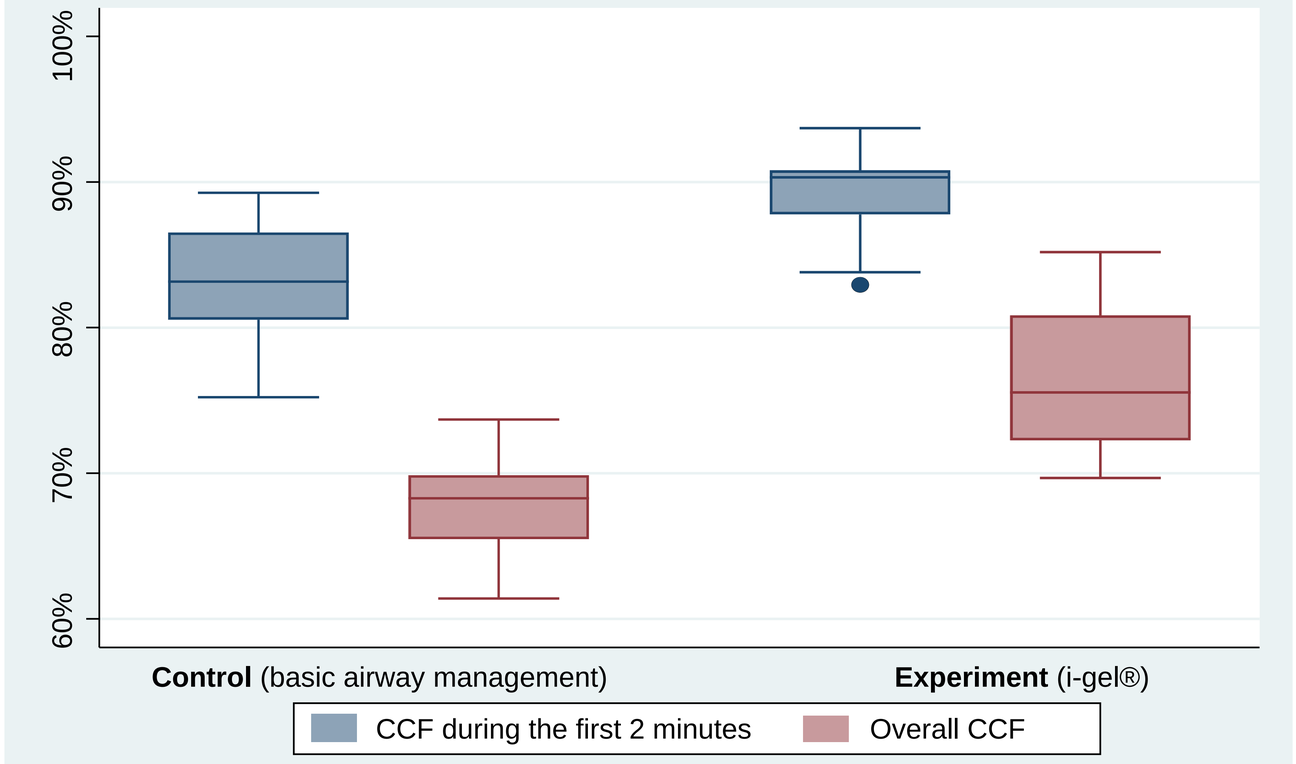
PERSPECTIVES

After minimal training, paramedics and EMTs applying the experimental approach achieved a higher CCF and enhanced ventilation parameters than those applying their standard of care, without delaying time to critical actions. However, the shallower chest compressions found in the i-gel® group deserve further investigation, as the depth of compressions is a key component of cardiopulmonary resuscitation.

Three interesting perspectives would be to assess the same approach 1) in a pediatric setting, 2) with first responders, and 3) in a clinical study.

RESULTS

Chest compression fraction (CCF)



Secondary outcomes

Outcome	Control (*n* = 13 teams)	Experiment (*n* = 13 teams)	*p*-value
Successful insertion - At first pass - At second pass	*NA*	11/13 2/13	*NA*
QUALITY OF CHEST COMPRESSIONS			
Compression depth[1]	5.2 cm [4.9;5.3]	4.6 cm [4.3;5.0]	0.007
Proportion within target (5 to 6 cm)[2]	67% (52-81)	42% (28-55)	0.01
Compression rate[2]	115 cpm (110-119)	116 cpm (112-120)	0.65
Full chest recoil[1]	99% [92;100]	98% [87;100]	0.90
CRITICAL ACTIONS			
Time to first shock[2]	41 s (35-47)	42 s (36-47)	0.85
Time to first ventilation[1]	103 s [93;110]	109 s [90;127]	0.74
Defibrillation attempts[1]	4 [4;5]	5 [4;5]	0.05
VENTILATION PARAMETERS			
Ventilations provided[2]	19 (16-23)	39 (33-46)	<0.001
Minute ventilation[1]	794 mL/min [689;1285]	2374 mL/min [2134;2672]	<0.001
Proportion within target (300 to 700 ml)[1]	82% [65;86]	95% [89;98]	0.003

[1] Median [Q1;Q3] [2]Mean (95%CI)

SCAN ME

The authors declare no conflict of interest. This study was funded by “Swissrescue.ch – Website for Prehospital Healthcare Providers”, by the Emergency Medical Services “Genève TEAM Ambulances” & “Compagnie d’Ambulances de l’Hôpital du Valais”, and by the Presidents’ Conference of the Swiss Paramedics Association. Trial registration: NCT04736446