Letter to the Editor

Is tracheal intubation possible during pediatric cardiopulmonary resuscitation without interruption of chest compressions? A simulation study

Sir,

Quick and safe airway management is essential during paediatric cardiopulmonary resuscitation (CPR); tracheal intubation (TI) is considered the definitive method for airway control during advanced CPR.¹ Current guidelines recommend performing chest compressions as continuously as possible, avoiding interruptions, even during other resuscitation procedures like TI.² However, few data support the ability to simultaneously perform these procedures fulfilling the recommended limit time (less than 30 s).³

A randomized crossover trial study was performed to test the ability of paediatric residents to intubate the trachea of manikins by means of standard direct laryngoscopy during continuous chest compressions (CCC). The Megacode Baby® and Megacode Junior® trainer manikins (Laerdal España, Madrid) were chosen. These manikins are representative of an infant 3 to 9 months old and 5 to 8 years old child, respectively. Twenty-three residents who were trained to intubate child and infant manikins were eligible. They were asked to perform TI in manikins assisted by standard laryngoscopes (Miller and Macintosh) according to age, while a colleague delivered CCC. Chest compressions were performed by a pediatrician trained on quality CPR, with the two thumb-encircling hands technique in the infant and the one hand technique in the child manikin.⁴ The sequence of manikin intubation was randomized.

Primary endpoints were the rate of successful placement of the tube in the trachea and the duration of the TI in seconds. Total intubation time (TTI) was defined as the time since the operator picked up the laryngoscope until the tube was deemed to be correctly positioned (by means of observation of clear thorax rising when insufflation with bag was done). To assess the subjective opinion about the difficulty of the procedure, participants were asked to rate it on a visual analogue scale (VAS) with a score from 0 (extremely easy) to 10 (extremely difficult). Quantitative data are presented as median and interquartile range (IQR).

In the infant scenario, the median (IQR) TTI was 28.2 (20.4–34.4) s. Seven of 23 participants required more than 30 s to perform TI, two of them requiring more than 45 s and one, more than 1 min. In the child scenario, the median (IQR) TTI was 20.2 (18.6–25.1) s. In three of 23 cases, the time required was longer than 30 s, one of them requiring more than 45 s, and another one, more than 1 min. Median (IQR) VAS score was 4 (2–6) in the infant scenario and 3 (0–6) in the child scenario (Table 1).

In simulated infant and child CPR scenarios, most of paediatric residents were able to intubate the trachea during CCC, validating at least “in vitro” the feasibility of the new guidelines. However, some of the participants failed to achieve TI in less than 30 s in such conditions (7 of 23 with the infant manikin and 3 of 23 with the child one). Our results suggest that, at least in infants, specific

Table 1

Tracheal intubation during chest compressions in infant and child manikins. Results for total intubation time as median (IQR) and for VAS as median (range).

N = 23	Laryngoscope
Infant	Miller
Total intubation time (s)	28.2 (20.4–34.4)
N time > 1 min	1
N time > 45 s	2
N time > 30 s	7
VAS difficulty (0–10)	4 (2–6)
Child	Macintosh
Total intubation time (s)	20.2 (18.6–25.1)
N time > 1 min	1
N time > 45 s	1
N time > 30 s	3
VAS difficulty (0–10)	3 (0–6)

TI training during chest compressions should be encouraged or, alternatively, a brief chest compressions stop (less than 30 s) should be considered in order to assure the success of TI and CPR. These results should be confirmed with data obtained from real patients.

Conflict of interest statement

No potential conflict of interest was declared by any of the authors.

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