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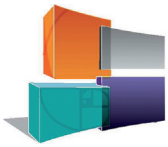

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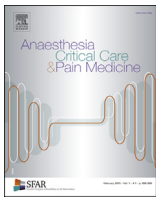

Original Article

Guidelines for care of the newborn baby at birth knowledge by prehospital emergency physicians

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ABSTRACT

Introduction: In 2010, the International Liaison Committee On Resuscitation (ILCOR) guidelines for care of the newborn baby immediately after birth were published.
Materials and methods: Using a questionnaire that was distributed to a sample of 44 prehospital emergency physicians (April 2014), we assessed knowledge of these guidelines, in particular specificities for newborns as compared to adults. Twenty-five questions, starting with a birth with no problems to one resulting in neonatal distress, were used to profile the practice of the surveyed physicians.
Results: Among the solicited physicians, 30 responded to the questionnaire (68%). Priority was given to efficient respiratory resuscitation during the first minutes of extrauterine life and the difficulties of newborn respiratory adaptation are well-known, but their implementation remains imperfectly understood. The assessment showed very mixed results, partly explained by the low frequency of newborn scenarios experienced by the practitioners who responded to the questionnaire.
Conclusion: To move from guidelines to their practical implementation is always delicate, with room for improvement such as continuing education, knowledge assessment and practice in the context of a quality approach. Well accepted, this evaluation process could be renewed upon publication of the next guidelines on this subject, thus contributing to their knowledge.

1. Introduction

In France, the out-of-hospital emergency medical system is a 2-tiered response system: a basic live support (BLS) tier served by teams of 3 professional rescuers and an advanced life support (ACLS) tier served by emergency physicians. In France, 5 out of 1000 deliveries occur out of the hospital [1] and each of these patients receives care from a rescue team with an emergency physician, unaccompanied by a midwife or obstetrician. Fortunately, the practice of newborn resuscitation at birth is an uncommon situation (about 1% of births) but is considered the most stressful and feared practice by emergency practitioners. Even experienced emergency physicians who are trained to conduct adult cardio-resuscitation generally feel difficulty when faced with a newborn baby. In 2010, the International Liaison Committee on Resuscitation (ILCOR) published guidelines on caring for a newborn baby immediately after birth, which were specific to delivery rooms [2–4].

The aim of this work was to assess the practical and theoretical knowledge of these guidelines by out-of-hospital emergency physicians.

2. Materials and methods

A questionnaire (Appendix 1) was proposed to out-of-hospital emergency physicians practicing in Paris and suburban districts through a web survey ("mon-enquete-enligne.fr®"). An alternative was to fill out a paper questionnaire. The questions were created from the 2010 ILCOR guidelines [2–4]. After general questions surrounding the physician's profile (number of years of experience, initial training, lifelong learning education, experience, etc.), the physician had to answer 25 single (SCQ) or multiple-choice (MCQ) questions about newborn care at birth. Answers were anonymized

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Table 1
Interviewed physicians' median grade comparison according to education (Mann-Whitney test, significativity $P < 0.05$).

Criteria	Sub-group	n =	Median note	P
Years of experience	Thesis < 11.5 years	15	8 [5–10]	0.15
	Thesis > 11.5 years	15	6.7 [5–8.4]	
Recent continuing training	No	17	6.2 [5.3–8.1]	0.13
	Yes	13	8.8 [6.2–9.9]	
Recent BLS training as instructor	No	18	6.2 [5.3–9.1]	0.25
	Yes	12	7.2 [6.3–9.8]	
Reading the ILCOR guideline	No	16	5.9 [5.2–7.1]	0.25
	Yes	14	8.9 [6.7–10.1]	
Experience of newborn baby resuscitation	No	11	6.4 [6.1–9.8]	0.95
	Yes	19	7.1 [5.1–9.6]	
Experience of simulation training	No	26	6.9 [5.3–9.1]	0.62
	Yes	4	7.1 [5.1–9.6]	

BLS: basic live support; ILCOR: International Liaison Committee On Resuscitation.

and analysed using Microsoft Office Excel 2010®. For each answerer, a final score out of 20 was calculated according to the correct answers to the 25 SCQs or MCQs. The median score [interquartile range (IQR)] was estimated. Mann-Whitney tests were used for comparisons and *P*-values below 0.05 were considered statistically significant. In the results section, the equation "$n = x$" was used to indicate the number of correct answers among interviewed persons.

After the physicians answered the questionnaire, they were sent the correct answers[1] and the following articles: "*Réanimation du nouveau-né en salle de naissance : qu'apportent les recommandations 2010 ?*" [2] and "*European resuscitation council guidelines for resuscitation 2010*" [3].

3. Results

During April 2012, a total of 44 physicians were interviewed, and 30 answered the questionnaire (68% response rate). The general questions were designed to describe the population of interviewed emergency physicians. The results are summarized in Table 1. Their past experience in emergency medicine ranged from 1 to 19 years, with a median time from obtaining their physician diploma of 11.5 years [9–15]. There was no difference in their lifetime training, their knowledge of guidelines, or their experience on simulated models or in real situations of newborn resuscitation.

Questions 1 to 3 dealt with the frequency of newborn medicalization immediately after birth. Two thirds of emergency physicians (n = 19) knew that one newborn out of 10 needs simple ventilatory assistance, while they overestimated the frequency of more aggressive resuscitation (n = 11), which is about one out of 100 [5,6]. Otherwise, 1 to 2% of births take place in a greatly premature context, before 32 weeks of amenorrhea, which was known by 18 of the interviewed physicians. The chance of an emergency physician being confronted with the necessity to perform intratracheal intubation on a newborn during extrahospital birth was rare. He/she was 10 times more exposed to the occurrence of simple respiratory distress, which could be rapidly resolved after clearing the airways, sometimes using aspiration or manual ventilation with a mask.

Knowledge concerning immediate care after normal birth was estimated by Questions 4 to 6. The step of wiping and drying the baby and putting him or her in a polyethylene bag was well-known by all of the physicians interviewed (n = 27). On the other hand, only one quarter (n = 7) knew that a premature baby needs to be born in a 26 °C preheated room and then put in a polyethylene bag and transported in a warm ambulance [3]. Only eight physicians knew that the umbilical cord must be cut only after one minute of life [2].

Knowledge of newborn clinical evaluation at birth was provided by Questions 7 to 10. Four physicians stated that they use skin coloration to evaluate newborns. Half of the physicians (n = 13) knew that heart rate was part of the algorithm in ILCOR resuscitation [2–4] (Fig. 1). Three out of 30 physicians knew that pulsed oximetry on the right hand is physiologically not over 80% before the 4th minute of life [6].

Newborn resuscitation procedures were assessed by Questions 11 to 20 [4–6]. The supremacy of manual positive pressure over other concerns was known by two thirds of the physicians (n = 21). But the method of ventilation was less well-known (n = 15): initial air ventilation in order to favour adaptation to extrauterine life, frequency, pressure and volume to use. Upper-airway aspiration was too frequently considered as systematic (n = 5), whereas the guidelines recommend it only in the case of overload or ventilatory distress, regardless of origin [5]. The first action of resuscitation was well-known in general: external manual chest compression with two thumbs (n = 22), hands naturally framing the thorax in order to provide posterior support with the other fingers, three chest compressions for one ventilation ratio (n = 18), then epinephrine injection if the heart rate is under 60 (bpm) (n = 25) [3].

Our study showed the under-utilization (n = 8) of umbilical venous catheterism in favour of intraosseous catheterism. Only two emergency physicians used an intratracheal approach while waiting for an intravenous one. In addition, early controlled global corporeal hypothermia after recuperation from anoxo-ischemic encephalopathy was not yet integrated in the usual practices of the emergency physicians (n = 8) [2]. Half of the emergency physicians (n = 18) continued resuscitation (question 21) as long as for an adult, despite guidelines that recommend stopping after 10 minutes of failure of well-done resuscitation. Questions 21 to 25 underscored the lack of knowledge concerning methods of palliative care (n = 6) (such as avoiding all invasive care, favouring comfortable care, etc.) and negative criteria leading to abstention of resuscitation (n = 1). Two thirds of the interviewed physicians ignored gestational term, which affects whether it is recommended to perform resuscitation for extremely premature babies on the edge of life (n = 10).

4. Discussion

This evaluation of emergency physicians' knowledge of the guidelines for care of a newborn baby immediately after birth showed heterogeneous results. Although the most important concepts were well-known, the differences between adult and newborn baby resuscitation were familiar to few physicians.

[1] Questionnaire answers: 1. b; 2. b; 3. b; 4. d; 5. b, d; 6. b; 7. e; 8. b; 9. a; 10. b, d; 11. c; 12. b, d; 13. a, c, d; 14. b; 15. b, e; 16. a; 17. b, e, f; 18. b, d, e; 19. a, c; 20. b; 21. b; 22. a, c, e, g; 23. d; 24. b, d; 25. a, b, c, d, e, f, g.