



## EDITORIAL

### Duration of resuscitation in neonates with Apgar scores at 10 min of less than 3 in the hypothermia era<sup>☆</sup>



### Duración de la reanimación en neonatos con Apgar a los 10 min menor de 3 en la era de la hipotermia

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Deciding when to discontinue cardiopulmonary resuscitation procedures (CPR) in asphyctic newborns (NBs) is complex. For some time it has been judged that children with an Apgar score of 0 at 10 min will very probably die or have severe neurological sequelae. The current international consensus on neonatal CPR (ILCOR 2010)<sup>1</sup> therefore recommends considering the cessation of CPR at 10 min postpartum when no heart beat has been detected up to that point (the Apgar score at 10 min remains 0), whereas it takes the view that there are insufficient data to establish recommendations when severe bradycardia (HR < 60) persists at 10–15 min after birth. However, the results of followup of NBs with hypoxic–ischaemic encephalopathy at the age of 6–7, published recently, suggest that the time may have come to reconsider this recommendation.<sup>2</sup>

We do not yet have a marker that allows us to establish a firm prognosis of death or severe neurological sequelae in patients with perinatal asphyxia during the first 10 min of life, but certain data may serve as a guide in making decisions. A systematic review published in 2007<sup>3</sup> assessed the

seven observational cohort studies that had tried to answer this question, together with data of its own, identifying a total of 94 patients: of these, 94% died or were handicapped severely, 2% were handicapped moderately, 1% were handicapped mildly and 3% lacked follow-up data. However, important methodological problems make it difficult to draw firm conclusions from these studies: some did not take account of the presence of congenital malformations or of gestational age, the data on followup was sparse in respect of duration and mode of assessment, and most of them were published over a decade ago. Finally, their results are difficult to transfer to the medical care we now offer, since none of these NBs had received hypothermia treatment. More recently, in 2009, Laptook et al.<sup>4</sup> showed the outcome at 18–22 months of asphyctic NBs admitted to the neonatal unit according to their Apgar scores at 10 min. This is a secondary observational study in neonates of over 35 weeks' gestational age who had been included in a randomised clinical trial to assess hypothermia treatment for hypoxic–ischaemic encephalopathy. The follow-up results at age 6 to 7 that this group has published recently<sup>2</sup> confirm the findings observed at 18 to 22 months of age: of the 24 children without a heart beat at 10 min (Apgar 10 min = 0), 5 (20.8%) survived free of moderate or severe handicap. Although the small number of patients does not allow conclusions to be drawn on the impact of hypothermia treatment on NBs with Apgar 0 at 10 min, in the study group as a whole cooling significantly reduced the risk of death or moderate/severe handicap

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associated with Apgar score at 10 min (OR, 0.44; 95% CI, 0.23–0.83).<sup>4</sup>

This study also revealed that in the hypothermia era, survival at age 6 to 7 years free of moderate or severe handicap for an Apgar score at 10 min of 0, 1, 2 was not very different (20.8%, 9% and 14.3%, respectively), whereas children with scores of 3 and 4 showed a rate of survival free of moderate or severe handicap of 36.1% and 55.3%, respectively. In the two studies included in the review carried out in the pre-hypothermia era a similar outcome was also observed between the children who had had Apgar scores of 0 at 10 min and those who had scores of 1 or 2.<sup>3</sup>

The set of data obtained in the era of therapeutic hypothermia, from hospitals where high quality can be expected in resuscitation technique and subsequent medical care, indicate that one must be cautious in establishing the duration of resuscitation. Factors such as the aetiology of the asphyctic event, the time without a detectable heart rate, the gestational age, the preconditioning or sensitisation of the patient, the quality of resuscitation procedures and of subsequent treatment potentially influence the response time and the outcome in a way that is difficult to assess at the time of resuscitation. The risk of continuing resuscitation in neonates with Apgar 0 at 10 min would lie in increasing the survival of patients with severe neurological sequelae, whereas stopping it would prevent the survival of NBs who would be free of moderate or severe sequelae at school age. Nowadays we have diagnostic tools of a clinical nature, neuroimaging, neurophysiological and neurobiochemical tools, which make it possible to assess the severity and extent of brain damage during the first 72 h of life much more precisely than Apgar score at 10 min.<sup>5</sup> Furthermore, even in those cases in which the decision is made to withdraw life support on account of the severity and extent of brain damage, the parents will have had time to get to know and be with their child and say goodbye. Although it is difficult to assess the impact of these measures, most parents value having seen and embraced their child while he or she

was alive, and this probably facilitates the grieving process.

The available data are still insufficient, but they do make it necessary to think anew about what the best moment is to decide whether to maintain or withdraw life support in NBs with the lowest Apgar 10 scores. Delaying this decision from 10 min until the first hours of life in those NBs who are slow to respond to CPR would make it easier to achieve greater certainty about the prognosis and would give time to ascertain the parents' opinion, which is very rarely available during initial resuscitation in the delivery room.

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