

3-lead electrocardiogram is more reliable than pulse oximetry to detect bradycardia during stabilization at birth of very preterm infants

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Abstract

Objectives: Current neonatal resuscitation guidelines suggest the use of ECG in the delivery room (DR) to assess heart rate (HR). However, reliability of ECG compared with pulse oximetry (PO) in a situation of bradycardia has not been specifically investigated. The objective of the present study was to compare HR monitoring using ECG or PO in a situation of bradycardia (HR <100 beats per minute (bpm)) during preterm stabilization in the DR.

Study design: Video recordings of resuscitations of infants <32 weeks of gestation were reviewed. HR readings in a situation of bradycardia (<100 bpm) at any moment during stabilisation were registered with both devices every 5 s from birth.

Results: A total of 29 episodes of bradycardia registered by the ECG in 39 video recordings were included in the analysis (n=29). PO did not detect the start of these events in 20 cases (69%). PO detected the start and the end of bradycardia later than the ECG (median (IQR): 5 s (0-10) and 5 s (0-7.5), respectively). A decline in PO accuracy was observed as bradycardia progressed so that by the end of the episode PO offered significantly lower HR readings than ECG.

Conclusions: PO detects the start and recovery of bradycardia events slower and less accurately than ECG during stabilization at birth of very preterm infants. ECG use in this scenario may contribute to an earlier initiation of resuscitation maneuvers and to avoid unnecessary prolongation of resuscitation efforts after recovery.

Keywords: bradycardia; electrocardiogram; neonatal resuscitation; preterm newborns; pulse oximetry.

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