Correct use of the Apgar score for resuscitated and intubated newborn babies: questionnaire study

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The Apgar score has played a crucial role in the delivery room assessment of newborn babies since 1953,1 2 but this system has its limitations and is prone to interobserver variation.1 4 Moreover, scoring definitions in textbooks vary slightly and no specific guidelines are available for scoring intubated babies. We studied variations between observers and focussed on the scoring of respiratory effort in resuscitated and intubated newborn babies.

Participants, methods, and results

We developed a questionnaire with three case presentations of newborns in which the Apgar score had to be determined.

Case 1—A full term newborn baby is breathing irregularly at five minutes after birth. Oxygen and mask and bag ventilation are applied. The infant's heart rate is 120 beats/min. The infant cries in response to stimulation, has some flexion of extremities, and is pink with blue extremities.

Case 2—A full term newborn baby is born after a breech extraction. The infant is immediately intubated and ventilated because of apnoea. At five minutes, the heart rate is 120 beats/min. The infant's heart rate is 120 beats/min. The infant is completely flaccid on the ventilator, does not respond to stimulation, and is pink with blue extremities.

Case 3—A preterm boy, born at 25 weeks of gestation, is intubated and ventilated immediately after birth. At five minutes the child is active on the ventilator with a heart rate of 120 beats/min and is pink with blue extremities. His muscle tone is normal for gestational age and response to stimulation is good.

A total of 166 paediatric professionals from nine general hospitals and three university hospitals in the Netherlands participated in the study (table). Scores for respiratory effort in case 2 and 3 varied most (standard deviation 0.90 and 0.84). We also found many different scores for colour and reflex irritability in case 1 and 3. In case 1, the total Apgar score assigned was 6 (16%), 7 (55%), 8 (21%), or 9 (7%). In case 2, the total Apgar score was 2 (1%), 3 (1%), 4 (68%), 5 (1%), or 6 (24%). In case 3, the total Apgar score was 7 (16%), 8 (23%), 9 (38%), or 10 (16%). (The bracketed values are the percentage of participants assigning that score.)

Comment

The assessment of the Apgar score varied greatly among participants, particularly when scoring respiratory effort in intubated newborn babies. The original definition for scoring respiratory effort states that an apnoeic infant should score 0, and an infant who “breathed and cried lustily” should score 2.1 2 All other types of respiratory effort, such as irregular shallow ventilation, should score 1.1 2 We propose therefore that an infant who is apnoeic and requires intubation and ventilation should receive the minimum value of 0 for respiratory effort, not withstanding the fact that normoxia may be achieved through adequate artificial ventilation. If an infant requires artificial ventilation at birth due to irregular or shallow ventilation, he or she should score 1. To assess whether an artificially ventilated infant is apnoeic or not, ventilation should be stopped briefly, when possible, to check for the presence of spontaneous respiratory movements.

Scores for colour and reflex irritability also varied widely. Although acrocyanosis (cases 1 and 3) should score 1, and a cry in response to a brisk tangential slap of the soles of the feet (case 1) should score 2, actual scores were incorrect in a third of cases.

For the Apgar score to survive another 50 years, uniformity in scoring is paramount. Paediatric professionals should follow Apgar’s original definitions more strictly, and consensus on scoring intubated newborn babies should be reached.

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