Resuscitation of a Term Infant with Meconium Staining

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The speaker has signed a disclosure form and indicated she has no significant financial interest or relationship with the companies or the manufacturer(s) of any commercial product and/or service that will be discussed as part of this presentation.

Session Summary

This case study describes the delivery room management and full resuscitation of a term infant with a non-reassuring fetal heart rate and meconium staining. We will explore what else may be contributing to resuscitation outcomes in this case patient.

Session Objectives

Upon completion of this presentation, the participant will:

▪ understand a case study of a term infant with on-reassuring fetal heart rate and meconium staining;

▪ be able to discuss factors that contribute to resuscitation outcomes.

References

AACOG Committee Opinion, Number 348, November 2006 (Reaffirmed 2012).


**Session Outline**

See presentation handout on the following pages.
Resuscitation of a Term Infant with Meconium Staining

History
41 year old Gravida 1
Prenatal screening negative
Pregnancy unremarkable

Labor History
Presented at 0730 in early labor
41 weeks gestation
Unremarkable labor until 1130pm
Late decelerations noted with contractions
Membranes intact

Delivery History
C/S Decision at 0130
Originally communicated as a “Stat” section for a poor pattern
Transferred to the OR at 0130
Incision at 0215
Meconium staining noted with ROM
Difficult delivery because baby was floppy
Cord gas drawn at birth

Resuscitation
Grossly hypotonic
Intubated – no meconium below the cords
Stimulated briefly → PPV with 100% O2 → intubated 3.5 ETT
1 minute Apgar 1 for heart rate of 50-60
Bagged at a rate of 60 with 100% oxygen by ETT
Poor chest excursion, breath sounds audible
Neonatologist notified and enroute

Resuscitation
At 2 minutes of life there is no improvement, breath sounds verified
SBH hypotonic, no response, spontaneous movement or breathing
Heart Rate 30-40 and falling
Epinephrine 1:10,000 given via ETT – 3mls
Chest compressions started
Bag and ventilation checked, Breath sounds checked again, ETT markings checked – no change, tube is at 9cms
UVC placed
Epinephrine repeated via UVC
Resuscitation
Heart Rate rechecked, 20 - 30
Reintubated quickly without event, 3.5 ETT
ETT secured at 9cms, BS = with bagging
Epinephrine repeated via UVC – 1 ml [BW est = 3kg] X 3
Volume expansion given X 2

Infant expired at 3am

Incidence
"The prevalence of fetal asphyxia, ranging from mild to severe at delivery, in the term infant is reported at 25 per 1,000 live births of these, 15% are either moderate or severe (3.75 per 1,000)".

"...in the absence of any other preconception or antepartum abnormalities, of approximately 1.6 per 10,000".


Umbilical cord gas analysis
"Umbilical cord blood analysis is assumed to give a picture of the acid-base balance of the infant at the moment of birth when the umbilical circulation was arrested by clamping of the cord.


"it is the gold standard assessment of uteroplacental function and fetal oxygenation/acid-base status at birth."

**AACOG Statement**

“Fetal asphyxia is a condition of impaired blood gas exchange leading to progressive hypoxemia and hypercapnia with a significant metabolic acidosis. The diagnosis of intrapartum fetal asphyxia requires a blood gas and acid-base assessment. The important question for the clinician is what is the threshold of metabolic acidosis beyond which fetal morbidity or mortality may occur?”

AACOG Committee Opinion, Number 348, November 2006 (Reaffirmed 2012)

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**Low and Associates Scoring System**

Defined umbilical arterial base deficits at birth as:

- **Mild**: 4-8 mmol/L
- **Moderate**: 8-12 mmol/L
- **Severe**: >12 mmol/L

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**Cord Gas Results**

Umbilical cord gas had been sent at delivery by obstetrical team at delivery:

- **pH**: 7.15
- **BE**: -7

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**Fetal Acid Base Disorders Review**

**Acidosis**: an increase in hydrogen ions in fetal tissue

**Acidemia**: an increase in hydrogen ions in fetal blood. Respiratory acidemia refers to an increase in the presence of a significantly elevated PaCO2 and a normal serum bicarbonate concentration. Metabolic acidemia refers to a low pH with a normal PaCO2 and a reduced concentration of arterial bicarbonate. Mixed acidemia exists when both conditions are present.

**Hypoxemia**: a decrease in oxygen content in fetal blood

**Hypoxia**: a decrease in oxygenation of fetal tissue.

**Anoxia**: hypoxia with metabolic acidosis. Newborns with hypoxia severe enough to cause anoxia will usually exhibit an acidosis.

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**Root Cause Analysis**

What is the relationship of the cord blood results to the cause of death?

Where is the significant acidosis?

What were the ramifications for the NNP?

What was the cause of death?

What were the lessons learned?
Questions for Discussion

References


