Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: The effects of oxygen use on newborns during delivery.

Report By: *Thomas Henderson*

2nd Party Appraiser: Jennifer Greene

Clinical Scenario: Code 1 call to the home of a 33 year old female, pregnancy complaint. The patients spouse meets EHS at the door stating "The baby is coming!" As you enter the home and find a female that appears to be in her early thirties sitting on her living room floor she states that she has the urge to push and there is noted crowning. As you prepare your equipment for delivery and possible neonatal resuscitation; you have a brief moment of reflection: should you have to resuscitate the baby, should you initiate positive pressure ventilations on room air, and progress to 100% oxygen delivery as NRP suggest? Would a prehospital oxygen blender produce better outcomes for babies? What is the best treatment for the baby?

PICO (Population – Intervention – Comparison – Outcome) Question:
P-Neonates in prehospital deliveries
I-Room air vs 100% oxygen delivery, use of oxygen blender
C- current practice
O-Mortality, morbidity

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Search Strategy:

First attempt:Prehospital use of oxygen on neonates, ocular damage, out of hospital use of Oxygen effect on neonates
Second attempt: Air vs oxygen at birth

Search Outcome:
First attempt: No documents matched the search.
Second attempt: 85

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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Tan A, Schulze AA, O'Donnell CPF, Davis PG. Air versus oxygen for resuscitation of infants at birth. *Cochrane Database of Systematic Reviews* 2005, Issue 2. Art. No.: CD002273.	*1302 Neonates from a total of 5 studies 2 randomized and 3 quasi randomized*	*Retrospective study. Systemic review with meta analysis*	In newborn infants requiring resuscitation, does the use of room air reduce the incidence of death, neurological disability and short term morbidity when compared with the use of 100% oxygen?	*Out of the 5 studies there was a slight decrease in mortality with infants treated with room air. Infants treated with room air had a better APGAR score at 5 minutes post birth, but the 10 minute APGAR score where equal. There was no difference in long term neurological damage.*	*Two of the five studies where randomized, and these studies had small sample sizes (under 500 patents) The studies where performed in hospital, no prehospital its where included. Of the 2 randomized studies, they where performed well.*
*Jennifer V. E. Brown1., Thirimon Moe-Byrne1., Melissa Harden1, William McGuire1,2**	484 neonates from 6 different studies. Randomized and quasi randomized.	*Retrospective study. Systemic review with meta analysis*	*Lower concentration oxygen use on neonates in the delivery room and outcomes of mortality and morbidity.*	One study allocation concealment was not described, it found a reduction in risk of death. Pooled risk ratio 0.65. This disappeared when the other 4 studies where added with adequate allocation concealment.	The studies had small sample sizes. Clinicians and investigators where aware of the interventions in 5 of the six trials.

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Comments: It was difficult to find studies involving oxygen use on neonate during pre hospital deliveries. Initially I had assumed that 100% oxygen delivery would increase mortality and was searching to see the adverse effects it may of had on the babies vision/neurological development. These systemic reviews changed the direction of my questioning, showing a slight decrease in mortality with infants treated with room air, and no change in long term neurological outcomes.

Consider: ***Both reviews are inconclusive, and stated that there is insufficient evidence to change current guidelines.***

Clinical Bottom Line: ***The conclusion of both systemic reviews are the same; insufficient evidence is present to suggest that treating infants with lower levels of oxygen at birth lowers mortality rates. There needs to be further randomized studies performed with larger groups to confirm or dismiss this hypothesis.***

References:

Air versus oxygen for resuscitation of infants at birth (Review)

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Jennifer V. E. Brown1., Thirimon Moe-Byrne1., Melissa Harden1, William McGuire1,2*
1Centre for Reviews and Dissemination, University of York, York, United Kingdom, 2Hull York Medical School, University of York, York, United Kingdom