Head Positioning to Reduce the Risk of Intraventricular Hemorrhage in Neonates; An Evidenced Based Practice Project

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Evidenced Based Practice at Children’s

- In our Nurse Practice Structure: the Clinical Practice, Informatics, and Research Council (CPIR) selected the Iowa Model of EBP for nursing at Children’s
- EBP nursing scholars fellowship program is held yearly for bedside nurses
- 6 week program with 8 hour class each week
- This presentation is about my project as an EBP scholar
Inspiration

- NICU RN at St. Paul Children’s for 3.5 years
- I have always loved science and research
- Majored in Neuroscience, interest was infant brain development
PICO Question

- For neonates less than 28 weeks gestational age, does the use of midline head positioning for the first 72 hours of life reduce the risk of intraventricular hemorrhage compared with current practice?
Current Practice

- There is no set clinical standard in place
- Practice varies based on RN judgment, respiratory needs
- Positioning of an infant is a nursing intervention
Intraventricular Hemorrhage

- Bleeding into the ventricles
- Premature infants have weak blood vessels in brain that rupture easily with changes in cerebral blood flow

Owens, 2005
Intraventricular Hemorrhage

- Three times more likely to occur in infants less than 28 weeks gestation than in infants 28-31 weeks gestation

- Significant cause of morbidity and mortality in premature infants

- Incidence of IVH was 26% from 2001-2003 with a 15% mortality rate in babies with a birth weight of 501-1500 grams at Vermont Oxford Network hospitals

Owens, 2005
Intraventricular Hemorrhage

- Contributing factors: delivery, resuscitation, handling, ventilation, speed of blood draws, clinical conditions/treatments
- Decreased ability to auto-regulate cerebral blood flow in ill preterm neonates
- Emphasis on prevention

Owens, 2005
Search Strategies

- PubMed, CINAHL, Google Scholar
- Terms: intraventricular hemorrhage, intracranial hemorrhage, prevention, nursing interventions, head positioning
# Criteria for Grading Evidence

## Criteria for Levels of Evidence

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>Level I</td>
<td>Evidence from a systematic review or metanalysis of all relevant randomized controlled trials (RCTs) or evidence-based clinical practice guidelines based on systematic reviews of RCT’s</td>
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<tr>
<td>Level II</td>
<td>Evidence obtained from at least one well-designed RCG</td>
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<tr>
<td>Level III</td>
<td>Evidence obtained from well-designed controlled trials without randomization</td>
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<tr>
<td>Level IV</td>
<td>Evidence from well-designed case-control and cohort studies</td>
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<td>Level V</td>
<td>Evidence from systematic reviews of descriptive and qualitative studies</td>
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<tr>
<td>Level VI</td>
<td>Evidence from a single descriptive or qualitative study</td>
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<tr>
<td>Level VII</td>
<td>Evidence from the opinion of authorities and/or reports of expert committees</td>
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Evidence Found

- No randomized clinical trials directly testing head positioning for prevention of intraventricular hemorrhage
- Studies showing effect of head positioning on intracranial pressure and cerebral blood flow
- Reviews recommending head positioning as Potentially Better Practice
Level III evidence: Quasi-experimental study

- Measured changes in cerebral blood flow and cerebral blood volume with head in midline and head rotated to the side
- Found that the mean cerebral blood volume was significantly higher when the head was rotated 90 degrees to the side
- “Rotation of the head to one side obliterates the internal jugular vein on the same side”

Pellicer, 2002
Level III Evidence: Quasi-experimental study

- Measured effects of six different head positions on cerebral blood velocity and intracranial pressure
- Found that ICP significantly increased when head turned to right compared to midline
- ICP lower when head elevated 30 degrees

Emery, 1983
Level III Evidence: Quasi-experimental study

- Measured cerebral blood volume variation in six different postures in stable, non-ventilated patients.
- Found that cerebral blood volume increased in patients <26 weeks with head rotated, but not in patients >26 weeks.
- Concluded that stable infants >26 weeks able to auto-regulate.
- Positioning important for critically ill neonates, and all neonates <26 weeks.

Ancora, 2010
Systematic Literature Review

- Multidisciplinary group from 5 institutions formed to examine evidence for potentially better practices to prevent IVH
- Used evidence-based approach to grade the evidence
- Developed 10 recommendations, including: “Maintain neutral head position when turning and positioning the infant with the head of bed elevated 30 degrees.” This was based on:
  - Level IV evidence: Well designed case-control or cohort study
  - Level VII evidence: Expert opinion/committees

Carteaux, 2003
Critical Literature Review

- Focused on nursing interventions to reduce risk of IVH
- Made 10 recommendations for nursing care, including “position with head in midline and head of bed slightly elevated” with the rationale that “intracranial pressure is lowest with head in midline and head of bed elevated 30 degrees”
- Head position recommendation based on 4 studies that examined the effect of head position on intracranial pressure
  - All 4 studies were Level IV: cohort studies

Kling, 1989
Recommendations

- Based on my findings, I recommend that infants less than 28 weeks be placed in midline position with the head of the bed raised 30 degrees for the first 72 hours.
Implementation

- Presented to the NICU’s Developmental Care Committee and the Neonatalogists
- Broadened guidelines to include neonates less than 31 weeks and/or 1500 grams.
- Expanded use of neutral head positioning to 5 days and included turning of infants
- New Standard of Care implemented
Evaluation

- Develop a retrospective study to evaluate new standard of care
- Obtain IRB approval in order to publish/present results
- Compare IVH rates for 2 years pre-implementation to 2 years post-implementation
- Recognize that many other variables could influence IVH rates
My Experience with the EBP Process

- Good foundation for investigating best ways of doing what we do
- Great way for nurses to make a difference
- Helps nurses feel valued
- I enjoyed it very much, would love to do it again
References


Thank you!

- Thank you for attending my presentation!
- Questions?