Postnatal Betamethasone Decreases Respiratory Index in Ventilated Extremely Low Birth Weight Neonates Compared to Conventional Care

Yuanyi Murray  
*New York Medical College*

Sanjeet Panda  
*New York Medical College*

Dina Finkel  
*New York Medical College*, dina_finkel@nymc.edu

Vanessa Mercado  
*New York Medical College*, vanessa_mercado@nymc.edu

Edmund F. La Gamma  
*New York Medical College*, edmund_lagamma@nymc.edu

Follow this and additional works at: [https://touroscholar.touro.edu/nymc_fac_posters](https://touroscholar.touro.edu/nymc_fac_posters)  
Part of the Pediatrics Commons, and the Respiratory Tract Diseases Commons

**Recommended Citation**


This Poster is brought to you for free and open access by the Faculty at Touro Scholar. It has been accepted for inclusion in NYMC Faculty Posters by an authorized administrator of Touro Scholar. For more information, please contact touro.scholar@touro.edu.
Postnatal Betamethasone Decreases Respiratory Index in Ventilated Extremely Low Birth Weight Neonates Compared to Conventional Care

Yuanyi Murray MD, Sanjeev Panda MBBS, Dina Finkel MD, Vanessa Mercado MD, Edmund F. LaGamma MD
Division of Newborn Medicine, Department of Pediatrics, New York Medical College, Maria Fareri Children’s Hospital, Valhalla NY 10595

Background
Bronchopulmonary dysplasia (BPD) is a major complication of ventilatory care and FIO2 in ELBW neonates. A 2010 AAP Policy indicated that glucocorticoids may be considered for ELBW on ventilatory care and affects up to 50% of ELBW neonates. A 2010 AAP Policy indicated that glucocorticoids may be considered for ELBW on ventilatory care and affects up to 50% of ELBW neonates.

Why Betamethasone (BETA) ?
- Antenatal BETA has been associated with a decreased risk of cystic periventricular leukomalacia (PVL) which can complicate the course of a neonate or the absence of glucocorticoid therapy (Baud O et al, N Engl J Med 1999; 341: 1190–1196)
- Betamethasone has been used in pregnancy for over 20 years with an unprecedented high level of safety and efficacy.
- The CNS penetration of BETA is lower compared to dexamethasone because of lower lipid solubility and higher binding to serum proteins. (Trenque T et al., Fundam Clin Pharmacol 1994; 8: 430–436)
- Betamethasone is a suitable alternative corticosteroid treatment for evolving BPD. Long term neurodevelopmental evaluations are in progress.

Objective
To determine whether low dose (0.125mg/kg IM), short course (every 24 hours for 3 days) BETA between 7-30 day postnatal age to abate progression of BPD. For > 16 years, we used postnatal BETA in lieu of dexamethasone or hydrocortisone to decrease ventilator support in high risk neonates because of its better safety profile (DeCastro, et al J Perinatal 29:297, 2009).

Methods
- This is a IRB approved, retrospective chart review from Jan 2013 - Dec 2015 of ELBW who were intubated, ventilated and required FIO2 > 0.35 between 7-30 day postnatal age. Patients who received low dose BETA (0.125mg/kg IM Q24hr) for short duration (3d) were compared to a cohort who fulfilled entry criteria without BETA.
- FIO2, and respiratory index (mean airway pressure x FIO2) were calculated at -7,-3,0,+1,+2,+3 and +7d after initiation of BETA along with demographics, respiratory co-morbidities.
- 2-way repeated measures ANOVA was used for statistical analysis.

Results
- Over the 3 year period of 247 ELBW admitted, data analyzed include 25 pts who received BETA and 26 controls.
- From -7d to 0d, average FIO2 was unchanged in both groups.
- At initiation of BETA, FIO2 was 0.67 ±0.24 & 0.45±0.16 (p=0.001) and RI was 7.5±5.3 & 4.1±1.9 (p=0.001) for BETA vs. control.
- PIP, Respiratory Index (RI) and FIO2 decreased at +7d compared to 0d in BETA group (p=0.008 for PIP, p=0.02 for RI, p=0.03 for FIO2), but no change in the control group.
- No significant difference in weight gain, hyperglycemia, uremia, INO use, infection, or NEC between the groups.
- Total number of ventilator days were 59±42 & 53±48 respectively and rate of BPD (O2 requirement at 36 weeks) were 88% (21/24) vs. 77% (20/26); pns.

Conclusion
- There’s a clinician selection bias to use BETA for sicker ELBW.
- There’s a significant short-term benefit of BETA in reducing the RI and FIO2 without increasing co-morbid complications.
- There’s no decrease in ventilator days or BPD with administration of BETA. Long term neurodevelopmental evaluations are in progress.
- We speculate that our clinicians selected patients with higher RI and FIO2 who may be too sick to lower BPD.
- A prospective RCT is in progress. We seek to determine if low-dose betamethasone is a suitable alternative corticosteroid treatment for evolving BPD.

ABSTRACT
Postnatal Betamethasone Decreases Respiratory Index in Ventilated Extremely Low Birth Weight Neonates

Postnatal Betamethasone Decreases Respiratory Index in Ventilated Extremely Low Birth Weight Neonates

Division of Newborn Medicine, Department of Pediatrics, New York Medical College, Maria Fareri Children’s Hospital, Valhalla NY 10595

Background
Bronchopulmonary dysplasia (BPD) is a major complication of ventilatory care and FIO2 in ELBW neonates. A 2010 AAP Policy indicated that glucocorticoids may be considered for ELBW on ventilatory care and affects up to 50% of ELBW neonates. A 2010 AAP Policy indicated that glucocorticoids may be considered for ELBW on ventilatory care and affects up to 50% of ELBW neonates.

Why Betamethasone (BETA) ?
- Antenatal BETA has been associated with a decreased risk of cystic periventricular leukomalacia (PVL) which can complicate the course of a neonate or the absence of glucocorticoid therapy (Baud O et al, N Engl J Med 1999; 341: 1190–1196)
- Betamethasone has been used in pregnancy for over 20 years with an unprecedented high level of safety and efficacy.
- The CNS penetration of BETA is lower compared to dexamethasone because of lower lipid solubility and higher binding to serum proteins. (Trenque T et al., Fundam Clin Pharmacol 1994; 8: 430–436)
- Betamethasone is a suitable alternative corticosteroid treatment for evolving BPD. Long term neurodevelopmental evaluations are in progress.

Objective
To determine whether low dose (0.125mg/kg IM), short course (every 24 hours for 3 days) BETA between 7-30 day postnatal age would reduce the respiratory index in ELBW vs. receiving conventional care (SRX, no steroid controls).

Methods
- This is a IRB approved, retrospective chart review from Jan 2013 - Dec 2015 of ELBW who were intubated, ventilated and required FIO2 > 0.35 between 7-30 day postnatal age. Patients who received low dose BETA (0.125mg/kg IM Q24hr) for short duration (3d) were compared to a cohort who fulfilled entry criteria without BETA.
- FIO2, and respiratory index (mean airway pressure x FIO2) were calculated at -7,-3,0,+1,+2,+3 and +7d after initiation of BETA along with demographics, respiratory co-morbidities.
- 2-way repeated measures ANOVA was used for statistical analysis.

Results
- Over the 3 year period of 247 ELBW admitted, data analyzed include 25 pts who received BETA and 26 controls.
- From -7d to 0d, average FIO2 was unchanged in both groups.
- At initiation of BETA, FIO2 was 0.67 ±0.24 & 0.45±0.16 (p=0.001) and RI was 7.5±5.3 & 4.1±1.9 (p=0.001) for BETA vs. control.
- PIP, Respiratory Index (RI) and FIO2 decreased at +7d compared to 0d in BETA group (p=0.008 for PIP, p=0.02 for RI, p=0.03 for FIO2), but no change in the control group.
- No significant difference in weight gain, hyperglycemia, uremia, INO use, infection, or NEC between the groups.
- Total number of ventilator days were 59±42 & 53±48 respectively and rate of BPD (O2 requirement at 36 weeks) were 88% (21/24) vs. 77% (20/26); pns.

Conclusion
- There’s a clinician selection bias to use BETA for sicker ELBW.
- There’s a significant short-term benefit of BETA in reducing the RI and FIO2 without increasing co-morbid complications.
- There’s no decrease in ventilator days or BPD with administration of BETA. Long term neurodevelopmental evaluations are in progress.
- We speculate that our clinicians selected patients with higher RI and FIO2 who may be too sick to lower BPD.
- A prospective RCT is in progress. We seek to determine if low-dose betamethasone is a suitable alternative corticosteroid treatment for evolving BPD.