



Lightning Learning: Oral Corticosteroid Therapy for Chronic Lung Disease of Prematurity in extreme preterms <24 weeks

WHAT?

Case:

Question: Oral Corticosteroid therapy for chronic lung disease of prematurity in extreme preterms <24 weeks

Evidence

- There is a lack of strong evidence in the literature that the benefits of postnatal corticoid therapy outweigh the effects, therefore it should only be used in select cases.
- The American Academy of Pediatrics (2010) Policy Statement – Since the previous AAP statement, no RCTs of other systemic glucocorticoids, such as prednisone or methylprednisolone to treat or prevent Bronchopulmonary Dysplasia have been published.

- AAP Policy Statement (2010) VLBW infants who remain on mechanical ventilation after 1 - 2 weeks of age are at very high risk of developing BPD. When considering corticosteroid therapy clinicians might conclude the risks of a short course of glucocorticoid therapy is warranted.
- Filippone (2019) Striking a balance between benefit and harm is not easy in most cases so the use of corticosteroids for Bronchopulmonary Dysplasia remains controversial. Research efforts have focused on identifying the safest preparation (dexamethasone vs hydrocortisone) and the optimal dosage and timing of systemic treatments.
- Zheng, (2018) Budesonide was associated with a decreased risk of BPD in extremely preterm and extremely low birth weight infants (OR 0.60, 95%CrI 0.36-0.93).
- Bhandari (2008) This paper studied infants with bronchopulmonary dysplasia after 36 weeks postmenstrual age. Oral prednisolone was effective in weaning off supplemental oxygen who had a pulmonary acuity score of <0.5 and PCO₂ of >48.5mm/hg. There was no benefit of multiple courses.

Clinical learning

References

- Watterberg (2010) American Academy of Pediatrics Policy Statement - Postnatal corticosteroids to prevent or treat bronchopulmonary dysplasia. *Pediatrics* **126** (4) pp.800-808.
<https://www.ncbi.nlm.nih.gov/pubmed/20819899>
- Filippone, M. et al (2019) Update on postnatal corticosteroids to prevent or treat bronchopulmonary dysplasia. *American Journal of Perinatology* **36** (suppl S2) pp.558-562.
<https://www.ncbi.nlm.nih.gov/pubmed/31238361>
- Zheng, L. (2019) Corticosteroids for the prevention of bronchopulmonary dysplasia in preterm infants: a network meta-analysis. *Arch Dis Child Fetal Neonatal Ed* **103** F506-511.
<https://www.ncbi.nlm.nih.gov/pubmed/29475879>
- Bhandari, A. (2008) Effect of a short course of prednisolone in infants with oxygen-dependent bronchopulmonary dysplasia. *Pediatrics* **121** (2) p.e34.
<https://www.ncbi.nlm.nih.gov/pubmed/18245407>

Table 1 Selected potential benefits and harms of systemic corticosteroids for BPD⁵⁻⁷

Early treatment						
Benefits	Dexamethasone			Hydrocortisone		
	Studies/Subjects	Effect size		Studies/Subjects	Effect size	
Mortality at 28 days	16/2603	1.06 (0.90–1.24)	NS	3/347	0.78 (0.50–1.23)	NS
Mortality at 36 weeks	14/2487	1.01 (0.89–1.14)	NS	6/1246	0.83 (0.65–1.06)	NS
BPD (28 days)	16/2621	0.85 (0.79–0.92)	$p < 0.001$	1/253	1.00 (0.85–1.18)	NS
BPD (36 weeks)	16/2584	0.71 (0.62–0.81)	$p < 0.001$	8/1345	0.91 (0.80–1.05)	NS
Death/BPD (28 days)	14/2293	0.91 (0.86–0.96)	$p < 0.001$	1/253	1.00 (0.90–1.12)	NS
Death/BPD (36 weeks)	16/2581	0.87 (0.80–0.94)	$p < 0.001$	9/1379	0.90 (0.82–0.99)	$p = 0.05$
Severe ROP	8/1507	0.77 (0.60–0.99)	$p = 0.043$	6/1070	0.87 (0.63–1.21)	NS
PDA	17/2706	0.76 (0.69–0.84)	$p < 0.001$	7/1307	0.82 (0.71–0.95)	$p < 0.001$
Harms						
Hyperglycemia	12/2117	1.35 (1.21–1.49)	$p < 0.001$	1/50	0.92 (0.50–1.67)	NS
Hypertension	11/1943	1.84 (1.53–2.21)	$p < 0.001$	1/50	3.0 (0.33–26.92)	NS
GI bleeding	10/1725	1.87 (1.35–2.58)	$p < 0.001$	2/91	1.53 (0.27–8.74)	NS
GI perforation	9/1936	1.73 (1.20–2.51)	$p = 0.004$	7/1104	1.70 (1.07–2.70)	$p = 0.02$
CP	7/921	1.75 (1.20–2.55)	$p = 0.004$	6/1052	1.05 (0.66–1.66)	NS
Death/CP	7/921	1.17 (1.00–1.37)	$p = 0.045$	6/1052	0.86 (0.71–1.05)	NS
Late treatment						
Benefits	Dexamethasone					
	Studies/Subjects	Effect size				
Mortality at 28 days	8/656	0.49 (0.28–0.85)	$p = 0.01$			
Mortality at 36 weeks	7/360	0.82 (0.50–1.35)	NS			
BPD (28 days)	6/623	0.87 (0.81–0.94)	$p < 0.001$			
BPD (36 weeks)	11/580	0.77 (0.67–0.88)	$p < 0.001$			
Death/BPD (28 days)	5/563	0.84 (0.78–0.89)	$p < 0.001$			
Death/BPD (36 weeks)	11/580	0.77 (0.70–0.86)	$p < 0.001$			
Extubation by day 7	15/761	0.65 (0.59–0.72)	$p < 0.001$			
Discharge on O ₂	7/611	0.71 (0.54–0.94)	$p < 0.001$			
Harms						
Hyperglycemia	17/1291	1.51 (1.26–1.81)	$p < 0.001$			
Hypertension	15/1235	2.12 (1.45–3.10)	$p < 0.001$			
GI bleeding	7/992	1.38 (0.99–1.93)	NS			
GI perforation	3/159	1.60 (0.28–9.31)	NS			
Cardiomyopathy	4/238	2.76 (1.33–5.74)	0.006			
Severe ROP	12/558	1.38 (1.07–1.79)	$p = 0.01$			
Blindness	13/784	0.78 (0.35–1.73)	NS			
CP	15/940	1.10 (0.79–1.54)	NS			
Death/CP	15/940	0.93 (0.77–1.12)	NS			

Abbreviations: BPD, bronchopulmonary dysplasia; CP, cerebral palsy; d, postnatal days; GI, gastrointestinal; NS, not specified; PDA, patent ductus arteriosus; ROP, retinopathy of prematurity; w, postmenstrual weeks.

Filippone, M. et al (2019) Update on postnatal corticosteroids to prevent or treat bronchopulmonary dysplasia. *American Journal of Perinatology* **36** (suppl S2) pp.558-562