Postnatal Corticosteroids to Prevent or Treat Bronchopulmonary Dysplasia.

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Background and Objective: Despite evolution in neonatal care over the last several decades, Bronchopulmonary Dysplasia (BPD) remains a major problem especially in extremely preterm babies. Postnatal steroids are one of the various strategies that have been extensively studied for prevention and treatment of BPD over last many decades. The aim of this review was to consider the risks versus benefits of treatment with corticosteroids after birth to prevent or treat BPD, allowing for the varying combinations of types of drug, and timing and routes of administration, with a focus on the major outcomes of BPD, mortality, and cerebral palsy.

Methods: Multiple systemic reviews of postnatal corticosteroids in newborn infants available in the Cochrane Library along with the strength of the evidence to support the overall conclusions reported by the review authors using the GRADE system were studied. Two other systematic reviews of intratracheal corticosteroids, including where corticosteroid has been mixed with pulmonary surfactant and instilled into the trachea were also analyzed.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet

Postnatal Corticosteroids for Bronchopulmonary Dysplasia (BPD)

Results: 1.**Inhaled steroids for prevention or treatment of BPD**

A)**Early (<14 days) inhaled corticosteroids** lower the risk of BPD (20% vs 27%), and combined mortality or BPD at 36 weeks (35% vs 40%). However, there is evidence that combined mortality at latest age or cerebral palsy are both higher in the inhaled corticosteroids. (Grade Quality of evidence: **Moderate**)

B)**Late (≥7 days after Birth) Inhaled Corticosteroids** The Cochrane review of late inhaled corticosteroids includes 8 RCTs and 232 participants with insufficient data to remark on outcomes. (Grade Quality of evidence: **Low to very Low**)

2. Early (<7 days) use of systemic steroids. Early systemic corticosteroids reduce the rates of BPD at 36 weeks (25% vs 31%), and combined mortality or BPD by 36 weeks (46% vs 51%). There is significant heterogeneity by the type of steroid in decreasing BPD with dexamethasone being more effective. Early systemic corticosteroids increase the rates of cerebral palsy in later childhood (11% vs 7%). The effects on cerebral palsy are mostly due to dexamethasone (16% vs 9%). Early systemic corticosteroids have no effect on combined outcome of cerebral palsy and mortality at the latest age reported. However, there is evidence for heterogeneity in favor of hydrocortisone in reducing mortality at the latest reported age. (Grade Quality of evidence: **High to Moderate)**

3. Late (>7 days) use of systemic steroids Late use of systemic steroids reduces the rates of BPD at 36 weeks (53% vs 59%), mortality to 36 weeks (12% vs 18%), and combined mortality or BPD by 36 weeks (65% vs 77%). All the beneficial effects are attributed to dexamethasone. Late systemic corticosteroids reduce the rates of mortality at the latest age reported (18% vs23%). However, there was no difference in the rates of cerebral palsy or combined death or cerebral palsy on follow-up between the two groups. (Grade Quality of evidence: **High to Moderate)**

4. Inhaled vs systemic use of steroids There are two cochrane reviews comparing inhaled with systemic steroids with small number of studies and limited data. There were no clear differences between early or late inhaled corticosteroids on comparing with systemic corticosteroids for BPD, mortality, or cerebral palsy. (Grade Quality of evidence: **Moderate to Low)**

5. Intratracheal Corticosteroids Administered with a Surfactant: In a metanalysis comparing treatment with corticosteroid administered with surfactant and placebo with surfactant groups, the risk of BPD and mortality was lower in the corticosteroid surfactant groups compared with the surfactant-only group. (Grade Quality of evidence: **Moderate to Low).**

EXPERT COMMENT

"Steroids seems like a magic bullet and the neonatologist is often tempted to use it to facilitate extubation in preterm neonates and prevent BPD. However, early usage of steroids for prevention of BPD is unsafe and should not be done. Steroids used judiciously in short courses with lower doses of dexamethasone after the first postnatal week in preterm infants at high risk of developing BPD may be safe and improve outcomes. Newer modalities like intratracheal corticosteroids with surfactant look promising but need to be evaluated further."

Dr Anil Batra
Senior Consultant, Neonatology
Madhukar Rainbow Children Hospital
New Delhi

With warm regards,

DR MANINDER S DHALIWAL

Editor – Academic Pearls
pedpearls@gmail.com

DR. PIYUSH GUPTA
IAP NATIONAL PRESIDENT 2021

DR REMESH KUMAR R.
IAP PRESIDENT 2022

DR BAKUL JAYANT PAREKH
IAP PRESIDENT 2020

DR G.V. BASAVARAJA
HON. SECRETARY GEN. 2021 - 22

Reference

Doyle L,W: Postnatal Corticosteroids to Prevent or Treat Bronchopulmonary Dysplasia. Neonatology 2021;118:244-251. doi: 10.1159/000515950.