

Treatment

Review: early postnatal corticosteroids reduce chronic lung disease in preterm infants, but increase complications

Halliday HL, Ehrenkranz RA. *Early postnatal (<96 hours) corticosteroids for preventing chronic lung disease in preterm infants*. *Cochrane Database Syst Rev* 2001;(2):CD001146 (latest version 14 Nov 2000).

QUESTIONS: Does early postnatal corticosteroid (PC) treatment given within the first 96 hours of birth decrease the risk of chronic lung disease (CLD) in at risk, preterm infants? Do PCs increase the risk of adverse effects?

Data sources

Studies were identified by searching the Oxford Database of Perinatal Trials, the Cochrane Controlled Trials Register, and Medline (1966 to September 2000); handsearching paediatric and perinatal journals; examining review articles; and contacting practising neonatologists.

Study selection

Randomised controlled trials were selected if they compared intravenous PC treatment given within 96 hours of birth with control (placebo or nothing) in preterm infants at risk of developing CLD.

Data extraction

Data were extracted on study methods, participant characteristics, and outcomes.

Main results

19 trials were included in the analysis. Most trials involved low birthweight infants with respiratory distress syndrome (RDS) who were receiving mechanical ventilation. The most common treatment assessed was

dexamethasone, 0.50 mg/kg/day for 3 days, followed by 0.25 mg/kg/day for 3 days, 0.12 mg/kg/day for 3 days, and 0.05 mg/kg/day for 3 days. Meta-analysis showed that early PC treatment reduced CLD and combined death or CLD at 28 days and at 36 weeks postmenstrual age, and need for late steroids; but increased metabolic complications (hyperglycaemia, hypertension, hypertrophic cardiomyopathy, and growth failure) and gastrointestinal complications (gastrointestinal bleeding and intestinal perforation) (table). It did not affect mortality at 28 days (14 studies, n=1637) or before discharge (19 studies, n=2567). Meta-analysis of long term follow up studies showed an increased risk of developmental delay, cerebral palsy, and combined death or cerebral palsy (table).

Conclusion

Early corticosteroid treatment within 96 hours of birth prevents chronic lung disease in at risk, preterm infants, but increases the risk of metabolic and gastrointestinal complications in the short term, and developmental delay and cerebral palsy in the long term.

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For correspondence: Professor H L Halliday, Department of Child Health, Queen's University of Belfast, Regional Neonatal Unit, Royal Maternity Hospital, Belfast, Northern Ireland BT12 6BB, UK. Fax +44 (0)289 023 6203. h.halliday@qub.ac.uk

Early postnatal corticosteroids (PCs) (<96 h after birth) v control in at risk, preterm infants*

Outcomes	Number of studies (n)	Weighted event rates		RRR (95% CI)	NNT (CI)
		Early PCs	Control		
Chronic lung disease (CLD) at 28 days	14 (1831)	39%	48%	21% (13 to 29)	10 (8 to 17)
CLD at 36 weeks postmenstrual age	13 (1653)	16%	26%	38% (25 to 49)	10 (8 to 17)
Death or CLD at 28 days	13 (1533)	54%	63%	14% (6 to 21)	12 (8 to 25)
Death or CLD at 36 weeks postmenstrual age	15 (2415)	43%	50%	14% (6 to 21)	15 (10 to 34)
Need for late steroids	9 (1865)	34%	48%	30% (22 to 37)	8 (6 to 10)
				RRI (95% CI)	NNH (CI)
Hyperglycaemia	11 (2016)	40%	27%	48% (32 to 66)	8 (6 to 10)
Hypertension	10 (1946)	22%	12%	84% (54 to 121)	10 (8 to 15)
Hypertrophic cardiomyopathy	1 (50)	52%	12%	333% (40 to 1240)	3 (2 to 6)
Growth failure	1 (50)	80%	12%	567% (127 to 1860)	2 (2 to 3)
Gastrointestinal bleeding	9 (1440)	12%	6%	90% (35 to 166)	17 (12 to 34)
Intestinal perforation	9 (1871)	8%	4%	98% (32 to 195)	25 (17 to 50)
Developmental delay	1 (248)	34%	20%	68% (8 to 161)	8 (5 to 34)
Cerebral palsy	2 (510)	21%	9%	132% (48 to 265)	9 (6 to 17)
Death or cerebral palsy	2 (510)	53%	39%	35% (11 to 64)	8 (5 to 20)

*Abbreviations defined in glossary; RRR, RRI, NNT, NNH, and CI calculated from data in article using a fixed effects model.

COMMENTARY

The aim of multidisciplinary teams that care for preterm infants in neonatal intensive care units is to reduce the risk of CLD without compromising the short and long term condition of these infants. It is therefore important for clinicians caring for preterm infants to use evidence based treatment regimens that are effective and are evaluated on a regular basis.

Corticosteroids, which are used to reduce persistent inflammation within the lungs, have both short term and long term effects. In 2 separate systematic reviews, Halliday and Ehrenkranz evaluated the evidence available on the use of PCs to reduce CLD and mortality, as well as the implications of short and long term side effects associated with early and moderately early intravenous PCs. Inhaled corticosteroids were not considered in either of these reviews as they were the subject of a separate review.¹⁹ 19 randomised controlled trials were included in the analysis of early PCs (given within 96 h of birth), whereas only 7 trials were included in the analysis of moderately early PCs (given at 7–14 d after birth).

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