

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

Halliday HL, Ehrenkranz RA. *Moderately early (7–14 days) postnatal corticosteroids for preventing chronic lung disease in preterm infants.* *Cochrane Database Syst Rev* 2001;(2):CD001144 (latest version 2 November 2000).

QUESTIONS: Is moderately early postnatal corticosteroid (PC) treatment given 7–14 days after birth effective for prevention and treatment 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 systemic PC treatment given 7–14 days after birth with control (placebo or nothing) in preterm infants with or at risk of developing CLD.

Data extraction

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

Main results

7 trials (8 treatment arms) were included in the analysis. The trials involved very low birthweight infants who were receiving mechanical ventilation; the corticosteroid was

dexamethasone, with a starting dose of 0.5 mg/kg/day and a duration of 2–42 days. Meta-analysis showed that moderately early PC treatment reduced mortality at 28 days (but not mortality before discharge [6 studies, n=288]), CLD at 28 days and 36 weeks postmenstrual age, combined death or CLD at 28 days and 36 weeks, and need for late steroid treatment (table); but increased risk of hyperglycaemia, hypertension, hypertrophic cardiomyopathy, gastrointestinal bleeding, and infection, (table). It did not affect long term outcomes of abnormal neurological examination (1 study, n=36) or combined death or abnormal neurological examination (1 study, n=36).

Conclusion

Moderately early corticosteroid treatment 7–14 days after birth reduces chronic lung disease and mortality in at risk, preterm infants, but increases risk of metabolic and gastrointestinal complications and infection.

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*Moderately early postnatal corticosteroids (PCs) (7–14 d after birth) v control for preterm infants with or at risk of chronic lung disease**

Outcomes	Number of studies (n)	Weighted event rates			NNT (CI)
		Early PCs	Control	RRR (95% CI)	
Chronic lung disease (CLD) at 28 days	6 (623)	76%	87%	13% (6 to 19)	10 (6 to 17)
CLD at 36 weeks postmenstrual age	5 (247)	34%	55%	38% (18 to 53)	5 (3 to 12)
Death or CLD at 28 days	4 (520)	82%	96%	14% (9 to 19)	8 (6 to 13)
Death or CLD at 36 weeks postmenstrual age	5 (247)	45%	72%	37% (22 to 49)	4 (3 to 7)
Need for late steroids	5 (545)	12%	24%	50% (29 to 65)	9 (6 to 17)
				RRI (95% CI)	NNH (CI)
Hyperglycaemia	7 (659)	35%	23%	51% (20 to 90)	9 (6 to 20)
Hypertension	6 (599)	8%	3%	173% (25 to 495)	20 (13 to 100)
Hypertrophic cardiomyopathy	3 (168)	27%	8%	229% (50 to 620)	6 (4 to 12)
Gastrointestinal bleeding	3 (485)	14%	8%	74% (2 to 198)	17 (undefined to 10)
Infection	7 (659)	33%	24%	35% (6 to 71)	12 (7 to 50)

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

COMMENTARY—continued from previous page

The reviews concluded that both early and moderately early PCs reduce CLD and the combined outcome of CLD or mortality. Although these benefits are substantial, the reviews also confirm that both early and moderately early PCs increase the risk of short term gastrointestinal and metabolic complications. These complications are clinically significant and present a dilemma to clinicians weighing the risks and benefits of this treatment. Evidence also suggests that early PCs increase the incidence of cerebral palsy and developmental delay. Because this finding is based on only 2 studies,^{2,3} further research is needed. Growth is another area of concern for clinicians and parents, and the review suggests early PCs are associated with growth failure. The effect of corticosteroids on growth is another area for further investigation.

It is important for clinicians caring for preterm infants to be aware of the short term adverse effects so that they can manage these conditions appropriately. The authors also emphasised the urgent need for further follow up studies of existing randomised controlled trials of postnatal steroids given at any time after birth. In view of the serious nature of the risks involved, the use of PCs should be reserved for situations where the benefits clearly exceed the risks.

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- 1 Shah V, Ohlsson A, Halliday HL, et al. *Cochrane Database Syst Rev* 2000;(2):CD001969.
- 2 Kothadia JM, O'Shea TM, Roberts D, et al. *Pediatrics* 1999;104:22–7.
- 3 O'Shea TM, Kothadia JM, Klinepeter KL, et al. *Pediatrics* 1999;104:15–21.