WHO recommendation on antenatal corticosteroid therapy in women undergoing planned caesarean section at late preterm gestations (34–36+6 weeks)

17 November 2015

Recommendation

Antenatal corticosteroid therapy is not recommended in women undergoing planned caesarean section at late preterm gestations (34–36+6 weeks).

(Conditional recommendation based on very low-quality evidence)

Publication history

First published: November 2015

Updated: No update planned

Assessed as up-to-date: November 2015

Remarks

- The GDG noted the paucity of evidence on the balance of benefits versus harms when antenatal corticosteroid is administered to mothers undergoing elective caesarean section (CS) in late preterm. The group acknowledged that while there might be some benefits, there might also be harms. Reference was made to the overall evidence on antenatal corticosteroid, which suggests potential harms in late preterm infants, and the fact that the population providing the evidence also included provider-initiated (elective) preterm birth.
- Elective CS should not normally be performed at any gestational age < 39 weeks.
- The GDG considered this to be a research priority but chose to recommend against the practice until further evidence becomes available

Background

Preterm birth, defined as birth before 37 weeks of gestation, is the single most important determinant of adverse infant outcomes, in terms of survival and quality of life. (1) Globally, it is the leading cause of
Infant mortality and morbidity from preterm birth can be reduced through interventions delivered to the mother before or during pregnancy, and to the preterm infant after birth. Interventions can be directed at all women for primary prevention and reduction of the risk of preterm birth (e.g. smoking cessation programme) or aimed at minimizing the risk in women with known risk factors (e.g. progestational agents, cervical cerclage). However, the most beneficial set of maternal interventions are those that are aimed at improving outcomes for preterm infants when preterm birth is inevitable (e.g. antenatal corticosteroids, magnesium sulfate and antibiotic prophylaxis). Special care of the preterm newborn to prevent and treat complications of prematurity is also critical to newborn survival. In high-income countries, reductions in mortality rates in infants that were born preterm have been driven largely by improved care and, more importantly, by appropriate policy changes.

**Methods**

The recommendations were developed using standard operating procedures in accordance with the process described in the WHO handbook for guideline development (11). Briefly, these included (i) identification of priority questions and critical outcomes, (ii) retrieval of the evidence, (iii) assessment and synthesis of evidence, (iv) formulation of recommendations, and (v) planning for the dissemination, implementation, impact evaluation and updating of the guideline.

The scientific evidence underpinning the recommendations was synthesized using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (12). Up-to-date systematic reviews were used to prepare evidence profiles for the priority questions. WHO then convened a Technical Consultation in May 2014 where an international group of experts – the Guideline Development Group (GDG) – formulated and approved the recommendations based on the evidence profiles.

In November 2014, an online consultation of the GDG was conducted to review and revise the recommendations in the light of the findings of a large implementation trial of antenatal corticosteroids in low-resource countries.

Further information on procedures for developing this recommendation are available [here](#).

**Recommendation question**

For this recommendation, we aimed to answer the following questions:

- Among pregnant women at risk of imminent preterm birth (P), is antenatal corticosteroid therapy (I), compared with no antenatal corticosteroid therapy (C), effective in reducing adverse newborn outcomes (O)?

- Which population of pregnant women should be offered antenatal corticosteroids? (considering the gestational age at presentation or birth; interval between presentation and anticipated birth; single and
multiple birth; status of amniotic membranes; and women undergoing elective caesarean section in late preterm)

- Which population of pregnant women should not be offered antenatal corticosteroids? (considering conditions where there are concerns that associated risks may outweigh benefits: women with diabetes mellitus, hypertensive disorders, chorioamnionitis and growth-restricted babies)
- Which corticosteroids (and regimens) should be used for eligible women?
- Should repeat course(s) of corticosteroids be offered to a woman who has completed a course of corticosteroid but remains at risk of preterm birth 7 days or more after the initial treatment?

Evidence summary

**Antenatal corticosteroids versus placebo or no treatment (elective caesarean section in late preterm birth)**

A systematic review of randomized and nonrandomized studies evaluating the effectiveness of antenatal corticosteroid therapy for reducing adverse newborn outcomes in women undergoing elective caesarean section (CS) in the late preterm period (i.e. > 34 weeks to 36+6 weeks of gestation) identified no eligible studies (13).

Indirect evidence was extracted from a Cochrane systematic review that assessed the effects of corticosteroid therapy compared with usual treatment on the prevention of neonatal respiratory morbidity after term elective CS (14). This review included one unblinded randomized trial in the United Kingdom (involving 942 mother and their babies), which compared betamethasone with usual treatment without corticosteroids in women undergoing elective CS (15).

**Maternal outcomes**

*Maternal infectious morbidity:* No events were reported for maternal infections, including wound infection.

**Infant outcomes**

*Fetal and neonatal death:* No events were reported for perinatal death or neonatal sepsis in either group.

*Severe neonatal morbidity:* No statistically significant reduction was found in the incidence of RDS (0.2% and 1.1% in corticosteroid-exposed and unexposed infants, respectively; RR 0.32, 95% CI 0.07–1.58), transient tachypnea of the newborn (RR 0.52, 95% CI 0.25–1.11), need for mechanical ventilation (RR 4.07, 95% CI 0.46–36.27), or duration of stay in the NICU (MD -2.14 days, 95% CI -5.58 to 1.30). Antenatal betamethasone was associated with significant reduction in the risk of admission to neonatal special care units (all levels) (RR 0.45, 95% CI 0.22–0.90), and particularly for respiratory complications (RR 0.15, 95% CI 0.03–0.64). The corresponding risk differences were -0.03 (i.e. 3% reduction, 95% CI -5% to -1%) and -0.03 (i.e. 3% reduction, 95% CI -5% to -0%), respectively, underscoring the low rates of the two outcomes. Antenatal betamethasone did not significantly reduce the overall rate of admission to neonatal special care (all levels) for any respiratory or non-respiratory indication (RR 0.81, 95% CI 0.49–1.33).

*Long-term morbidity:* Academic ability during childhood was reported for 407 infants followed through childhood; there were no clear differences between the comparison groups.

Further information and considerations related to this recommendation can be found in the WHO guidelines, available at:
Implementation considerations

- The successful introduction of this recommendation into national programmes and health-care services depends on well-planned and participatory consensus-driven processes of adaptation and implementation. The adaptation and implementation processes may include the development or revision of existing national guidelines or protocols based on this recommendation.
- The recommendation should be adapted into a locally appropriate document that can meet the specific needs of each country and health service. Any changes should be made in an explicit and transparent manner.
- A set of interventions should be established to ensure that an enabling environment is created for the use of the recommendations, and that the behaviour of the healthcare practitioner changes towards the use of this evidence-based practice.
- In this process, the role of local professional societies is important and an all-inclusive and participatory process should be encouraged.

Research implications

The GDG identified these priority questions related to antenatal corticosteroids for imminent preterm birth recommendations:

- What are the long-term outcomes of all infants exposed to antenatal corticosteroids (including term infants)?
- What strategies can effectively and safely increase the use of corticosteroids in low- and middle-income country (LMIC) settings to improve outcomes?
- What are the effects of antenatal corticosteroid at different gestational ages at birth (using independent patient data analysis)?
- Assessment of coverage of antenatal corticosteroids before and after guideline implementation (and associated reduction in neonatal mortality).
- Assessment of implementation strategies and monitoring of adverse events (in LMIC settings).
- What are the effects of antenatal corticosteroid administration in women undergoing prelabour caesarean section in late preterm?
- What are the effects of task shifting in the context of antenatal corticosteroid administration (e.g. using the first dose in the community followed by referral to a health-care facility)?
- Are there differences in the pharmacokinetic properties of betamethasone acetate versus betamethasone phosphate (consider using available data in settings where they are routinely used)?
- What is the impact of antenatal corticosteroid administration among mothers with evidence of infection who also receive appropriate antibiotic therapy on both maternal and neonatal outcomes?
- What is the minimum effective dose of corticosteroids to achieve fetal lung maturation and other improved outcomes?
- What is the minimum effective dose required for repeat courses of antenatal corticosteroids?
- What is the most effective regimen and dose for antenatal corticosteroids?
- In what contexts can antenatal corticosteroids be used safely and effectively in low-income countries?
**Related links**

WHO recommendations on interventions to improve preterm birth outcomes (2015) – [full document](http://www.who.int/kms/handbook_2nd_ed.pdf) and [evidence tables](http://gradeworkinggroup.org/)

**Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors**

**Pregnancy, Childbirth, Postpartum and Newborn Care: A guide for essential practice**

**WHO Programmes: Sexual and Reproductive health**

**Maternal Health**

**Infant, Newborn Health**

**References**


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