WHO recommendation on antenatal corticosteroid therapy for women at risk preterm birth with a single or multiple pregnancy

17 November 2015

Recommendation

Antenatal corticosteroid therapy is recommended for women at risk of preterm birth irrespective of whether a single or multiple birth is anticipated.

(Strong recommendation, low-quality evidence)

Publication history

First published: November 2015

Updated: No update planned

Assessed as up-to-date: November 2015

Remarks

- This recommendation precludes the routine (or prophylactic) administration of antenatal corticosteroid to any woman with a multiple pregnancy, on the basis of increased risk of preterm birth.
- The GDG acknowledged the lack of clarity on the benefits of antenatal corticosteroids in the subgroup of women carrying multiple fetuses, but based its judgement on the overall improvement in critical outcomes among singleton infants, in addition to the fact that the point estimates were all in favour of reduced risks of adverse critical outcomes reported in multiple pregnancy. The group considered the potential impact of any clinical benefit in this group of women (who are inherently more likely to deliver preterm), albeit modest, on the overall preterm newborn survival and morbidity rates, and therefore made a strong recommendation.
- Although there remains some level of uncertainty about the effectiveness of antenatal corticosteroids in multiple pregnancy, the GDG does not consider this to be a research priority.

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 perinatal and neonatal mortality and morbidity. (2) Preterm infants are particularly vulnerable to complications due to impaired respiration, difficulty in feeding, poor body temperature regulation and high risk of infection. (3-5) With the increasing contribution of neonatal deaths to overall child mortality, it is critical to address the determinants of poor outcomes related to preterm birth to achieve further reductions in child mortality. (6-8)

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. (9) 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). (10) 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). (9) 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 (singleton versus multiple pregnancy)

Results for the effects of corticosteroids compared with placebo according to whether the pregnancy was singleton or multiple were available from 12 trials included a Cochrane review (13). Of these, only one to two trials provided data for comparisons related to multiple pregnancies.

Maternal outcomes

Maternal infectious morbidity: The review showed no statistically significant differences between comparison groups for chorioamnionitis, in women with singleton pregnancies or in women with multiple pregnancies.

Infant outcomes

Fetal and neonatal death: The reduction in fetal and neonatal deaths observed in singleton pregnancies (RR 0.79, 95% CI 0.65–0.96; 3 studies, 1425 babies) was not demonstrated in the analysis for multiple pregnancies (RR 0.71, 0.41–1.22; 2 studies, 252 babies), although there was a trend towards benefit. The same pattern was observed for neonatal deaths alone.

Severe neonatal morbidity: The reduction in RDS for singleton pregnancies treated with corticosteroids (RR 0.60, 95% CI 0.51–0.70; 12 studies, 2907 infants) did not reach statistical significance for multiple pregnancies (RR 0.85, 95% CI 0.60–1.20; 4 studies, 320 infants). Similarly, no significant reduction was demonstrated in the rate of cerebroventricular haemorrhage or mean infant birth weight in women with multiple pregnancies treated with corticosteroids compared with placebo/no treatment.

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

http://apps.who.int/iris/bitstream/handle/10665/183037/9789241508988_eng.pdf?sequence=1

http://apps.who.int/iris/bitstream/handle/10665/183038/WHO_RHR_15.17_eng.pdf?sequence=1

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 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](#) and [evidence tables](#)

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
Supporting systematic review:

**Roberts D, Dalziel S. Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. The Cochrane database of systematic reviews. 2006(3):CD004454.**

**References**


**Citation:** WHO Reproductive Health Library. WHO recommendation on antenatal corticosteroid therapy for women at risk preterm birth with a single or multiple pregnancy (November 2015). The WHO Reproductive Health Library; Geneva: World Health Organization.

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