WHO recommendation on provision of care in a thermo-neutral environment for newborns who cannot be given Kangaroo mother care

17 November 2015

Recommendation

Unstable newborns weighing 2000 g or less at birth, or stable newborns weighing less than 2000 g who cannot be given Kangaroo mother care, should be cared for in a thermo-neutral environment either under radiant warmers or in incubators.

(Strong 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

- A thermo-neutral environment was considered to be environmental conditions under which a baby maintains temperature in a normal range at minimum metabolic rate.
- There is insufficient evidence to support superiority of either radiant warmers or incubators over the other for the care of preterm babies. In making any choice between the two devices, the health-care providers’ preferences and costs should be considered.
- The selection of a device for creating the thermo-neutral environment, and the strategy for its use, should be carefully assessed in the relevant context, i.e. the patient population (including size, maturity and concurrent illnesses), the physical environment, personnel, cost and other resources.

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 question:

- In unstable preterm newborns who cannot be (exclusively) cared for by Kangaroo mother care (P), are there other superior methods for providing thermal care to maintain optimal body temperatures (I), compared with incubators (C), that are effective in improving newborn outcomes (O)? If so:
  - Are radiant warmers superior to incubators in the provision of thermal care for these preterm babies?
Evidence summary

Radiant warmer versus incubator for sick or unstable neonates:

Evidence related to the comparative effects of radiant warmers and incubators was obtained from one Cochrane review that compared nursing preterm newborns in radiant warmers (with the baby either naked or clothed) with controls (13).

In the control group, the infant was either naked (except for nappies) or clothed and was nursed in an air-heated, single or double-walled incubator, controlled manually or by servo-mechanism. Eight trials involving 156 preterm babies were included in the review and all were conducted in neonatal intensive care units (NICUs) in HICs. Infants recruited into the studies had gestational ages of 28–32 weeks and weighed 1.1–1.6 kg at birth. Exposure to the intervention varied between 1 hour and 3 days in six trials and between 7 and 35 days after birth (or until the baby weighed 1.8 kg) in the remaining trials. In some trials, additional interventions such as humidification or heat shields for the incubators were employed for babies in the control groups, and phototherapy was also provided to some babies in the intervention group. No additional relevant studies after the publication of the Cochrane review were found. Overall the data were limited and the quality of evidence was very low.

Neonatal death: Two trials involving 94 preterm newborns yielded inconclusive evidence on the risk of neonatal mortality for babies nursed under radiant warmers compared with those nursed in incubators (absolute risks: 2.1% versus 10.6%; RR 0.27, 95% CI 0.05–1.59).

Severe neonatal morbidity: One study involving 60 preterm newborns reported risks of sepsis and bronchopulmonary dysplasia (BPD), but there were very few events and the confidence interval was very wide. Two studies (with 90 preterm newborns) showed no significant impact of the intervention on rates of severe intraventricular haemorrhage (IVH) (0% versus 2.2%). The mean time taken to regain birth weight was similar in both trials (MD 0.86 days, 95% CI -1.49 to 3.10 days).

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 that further research on the following high-priority questions is needed:

- What is the optimal frequency of follow-up for mothers providing KMC after discharge from the health-care facility?
- What is the minimum threshold of KMC exposure needed to achieve an impact on neonatal mortality and other important outcomes?
- Can KMC be effectively initiated in the community setting in LMICs?

Related links


Supporting systematic reviews:


Other links of interest

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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