CARE FOR PRETERM BIRTH IN SINGLETON PREGNANCIES

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1. INTRODUCTION

When the delivery occurs before 35.0 weeks of gestation, there are some aspects to be considered that differ from those of a term delivery. The objective of this protocol is to set out in detail, and in a schematic way, those aspects to be considered (before, during and after the delivery) in the delivery care of a preterm baby.

2. CONSIDERATIONS BEFORE DELIVERY

- Remember to start the following **medication** in the patient in labour:

Magnesium sulphate if < 32.0 weeks (or < 34.0 weeks in the case of a fetus with Intrauterine growth restriction (IUGR)). It is advisable to introduce MgSO4 only when there is a risk of imminent delivery or unstoppable progression of cervical conditions (either because it progresses despite tocolysis, or because tocolysis is not indicated) in a previously stable patient.

Antibiotic: if the patient has not received previous antibiotic therapy, consider starting antibiotics if:

  - The vagino-rectal sampling for S. agalactiae (also known as GBS) is positive or unknown.
  - Clinical suspicion of chorioamnionitis.
  - Preterm prelabour rupture of membranes (PPROM).

- Adapt the room temperature: delivery room, operating room and neonatal resuscitation room (if it is a different room) to 23-25ºC, and in case of delivery < 28.0 weeks, to 25-27ºC (remember that after the newborn leaves the delivery room, the temperature can be reduced as indicated by the medical team). Ensure a draught-free area.

- Contact the **Neonatology team**: it is necessary to contact Neonatology as far in advance as possible, since the optimal scenario implies that the neonatologist can be present in the delivery room to carry out an immediate assessment of the newborn. The minimum information that must always be provided is:
  - Verify the availability of the Neonatal Intensive Care Unit (NICU) to take the preterm baby.
  - Information about gestation:
    - Identification of the patient (name and medical history number)
    - Gestational age, estimated fetal weight and sex.
    - Relevant history and brief summary of the current episode (include serology and GBS).
    - If there is a suspicion of infection, and results of amniocentesis/cultures.
    - Treatment received: administration of corticosteroids (number of doses), antibiotics and/or MgSO4.
    - In case of PPROM: Time from PPROM and time from anhydramnios.
  - Prognosis of the delivery:
    - Expected time until delivery (imminent vs attempted tocolysis).
    - Delivery method. Remember that in case of delivery with general anaesthesia, neonatology must be informed and the caesarean delivery should be performed urgently as soon as anaesthesia allows the surgery to start. The cord should be clamped immediately after delivery of the newborn (early cord clamping) with the aim of minimising the secondary effects of the mother's general anaesthesia on the newborn.
- Contact the **Midwives team**:
  - Ensure communication between neonatology and the Midwives team to confirm availability of all the necessary material in the delivery resuscitation room at the time of the delivery. Normally, the necessary material is:
    - Flat resuscitation surface and radiant heater
    - Cardio-respiratory resuscitation equipment (suction system, pulse oximeter, ventilation system).
    - Medication for immediate resuscitation (adrenaline) and surfactant.
    - System of warmed humidified respiratory gases at 37ºC, with medical gases for neonates.
    - Preheated head cap, warm clothes and preheated polyethylene wrapping for neonates < 32s and/or < 1500g.
    - Transportable incubator preheated to 36.5-37ºC.
  - Ensure the availability of a midwife and auxiliary support for newborn care and request support from the neonatal nurse in the case of extreme prematurity (if < 28 weeks).

- Contact the **Anaesthesiology team**:
  - Inform them of the expected delivery method.
  - Anticipate potential difficulties in extraction if it is by caesarean delivery: very early gestational ages, long-standing oligohydramnios.
  - Inform the team of possible complications (uterine overcontraction, massive haemorrhage, etc.) to consider potential solutions such as the use of uterine relaxants (nitroglycerin or the early administration of uterotonics).
- **Inform the parents**: This must be done together with Neonatology. Parents should be informed of possible intrapartum and postpartum neonatal complications based on gestational age and the delivery method; and of possible maternal complications (especially in the event of vaginal deliveries or caesarean deliveries at very early gestational ages). All the actions planned in each case must be explained to the parents and their consensus with our action is of vital importance, especially in very extreme gestational ages. When advising parents, it will be essential to know the prognosis regarding survival and sequelae in the preterm baby according to the gestational age, weight, etc. These figures may vary depending on the health care centre and must be provided by the neonatology team.

3. MANAGEMENT OF PRETERM BIRTH

Things to keep in mind during labour:

- We recommend the lithotomy position for childbirth in view of the actions that we must carry out during and after the birth of the newborn.
- We recommend continuous cardiotocographic monitoring in our centre, despite the scarce evidence on the effect of continuous versus intermittent monitoring on perinatal outcomes in preterm babies, and taking into account that a correct cardiotocographic record has a high negative predictive value (NPV) but an unsatisfactory record does not necessarily reflect hypoxia or fetal acidosis (especially in preterm births).
- It is not advisable to carry out fetal scalp blood sampling for pH in gestations <34.0 weeks. Given the limited literature available, the indication of its performance between 34.0 and 36.6 is controversial. Therefore, it may be indicated occasionally in patients with a positive prognosis for vaginal delivery (good progress of labour and advanced cervical conditions).
- If the birth requires an assisted vaginal delivery, the forceps or Thierry's spatulas are instruments of choice in preterm births. The contraindication against vacuum extraction is complete if the gestational age is <34.0 weeks; and relative if the gestational age is between 34.0 and 36.0 weeks (scarce evidence in clinical guidelines).
- Inform the neonatology team that the delivery is about to take place. For preterm births of less than 30 weeks, the plan is for the neonatologist to be present in the delivery room during delivery. If the delivery

occurs by caesarean, a neonatologist will enter the operating room (if the preterm baby is less than 30 weeks), with a sterile gown and gloves to be able to pick up the newborn and conduct the initial evaluation described below.

Mode of delivery

- Delivery ≥26.0 weeks:
  - If CEPHALIC presentation: we recommend vaginal delivery as first option (if there are not any maternal-fetal contraindications to vaginal delivery).
  - If NON-CEPHALIC presentation: we will recommend caesarean delivery as first option.
- Delivery around viability: between 23.0 (or 24.0 according to health care centre) and < 26.0 weeks:
  - If CEPHALIC presentation: Vaginal delivery as the first option (in the absence of maternal-fetal contraindications to vaginal delivery).
  - If BREECH presentation: There is controversy regarding the mode of delivery. Consider:
    1. The limitation of the available evidence: there is controversy between the 2013 and 2018 systematic reviews (without prospective or randomised studies) and hardly any information on 23-week pregnancies;
    2. The technical difficulty and the risk of morbidity derived from performing a caesarean delivery at this gestational age range;
    3. Morbimortality outcomes at extreme gestational age, which may differ by health care centre.

We consider that the potential risks/benefits are not sufficient to make a firm recommendation, since they depend greatly on the gestational age, the development of the labour, the experience of the professional who attends the delivery, the characteristics of the patient, and the complexity and equipment of the delivery centre in these situations must be individualised on a case-by-case basis by the attending specialists.

In these cases, it is very important **to agree on the mode of delivery with the parents and the neonatologists.**

That's why, in our centre, given that the viability is from 23.0 weeks (although each case may be individualised and always agreed with the parents), the suggestion is:

- If uterine contractions established, delivery conditions (approximately >3-4 cm dilation and Hodge plane I), correct cardiotocographic record and adequate progression: consider the possibility of vaginal delivery.
- In a case of less than 24.0 weeks in which the paediatrician and the parents have agreed NOT to resuscitate the newborn, vaginal delivery will be the option.

  - If NON-LONGITUDINAL fetal situation: Caesarean delivery.

4. IMMEDIATE POSTNATAL CARE FOR THE PRETERM NEWBORN

1) **Polyethylene wrapping** will be used if the newborn is <32.0 weeks and/or <1500 grams, to prevent heat loss. Place the newborn in a polyethylene wrapping previously conditioned at 26ºC, cover the head and body as soon as possible (it is not necessary to wait for the umbilical cord to be clamped). Regardless of gestational age, if the polyethylene wrapping is not required, it is necessary to avoid the heat loss of the newborn by covering him or her with **preheated dry blankets or sheets** and changing these if they become damp, and also ensure draught-free areas.

2) Placement of the **preheated head cap** (if the newborn requires a polyethylene wrapping, it will be placed on top of the bag). In the same way, the newborn's identification will be placed on the newborn's head cap if a polyethylene wrapping is required in order to avoid heat loss that would be caused by opening the bag to place it on the ankle.

3) Place the newborn between the mother's legs (previously create space) so that it is at or below the placenta level until the cord is clamped.

4) **Moment of cord clamp:**

The first thing to consider after birth is whether the neonate has the necessary stability to perform late cord clamping. The stability or lack of stability of the newborn will be determined by the neonatologist (or by the midwife/gynaecologist in the absence of the neonatologist). In general terms, we can say that a newborn who shows signs of vitality (spontaneous movements or respiratory sounds) is likely to be able to have late clamping.

- If the neonate is stable: perform late clamping after a minimum of 30 seconds and optimally at 60 seconds. A cord clamp beyond 3 minutes is not recommended. Late clamping is important regardless of the degree of prematurity.
- If the neonate is unstable or impossibility of waiting at least 30 seconds: the action in this situation is controversial. Given that we currently do not have enough information to make a recommendation on whether or not to perform cord milking prior to early cord clamping, we will be guided by the recommendations of the neonatology team that evaluates the newborn at the time of birth.

How to perform milking: collapse the cord with your hand more than 20 cm away from the newborn, and slide the hand gently towards the newborn for about 2-3 seconds to facilitate the passage of cord blood to the newborn. Release the umbilical cord for 2 seconds to allow it to fill and repeat the manoeuvre 3-5 times. Clamp the cord afterwards.

If possible, **always clamp the cord about 4-5 cm from the newborn's navel** to facilitate posterior vascular access if required by neonatology.

Record in the labour report the time elapsed from birth to cord clamping and whether cord milking has been performed.

5) **Notify** neonatology at the moment **in which the cord is clamped**, to activate the clock for evaluating the Apgar score in the resuscitation room.

6) **Collection of cord blood:** If gestational age below 32 weeks and/or <1500 grams of estimated fetal weight or suspicion of serious pathology. This blood will be used by the neonatologists to carry out a first analysis and crossmatch tests of the newborn. Cord blood collection should be performed as distal as possible to the placenta and avoid squeezing the cord to prevent contamination by Wharton's jelly.

7) **Promote the bond** between mother and newborn: skin-to-skin contact whenever possible, optimising the measures that prevent the newborn from heat-loss (delivery room temperature 23-25ºC without drafts, putting on a head cap after birth, covering with dry preheated sheets/towels and change these if they get wet).

- If gestational age 35.0 weeks or higher and vigorous/stable neonate: favour skin-to-skin directly.
- If gestational age between 32.0 and 34.6 and vigorous neonate: act as directed by the neonatologist. The newborn must be supervised by a healthcare professional and/or monitored with a pulse oximeter, and position and observation guidelines will be given to the family. It is especially important to avoid heat-loss and to control the newborn's temperature every 15-30 minutes until confirming that it remains correct (36.5-37.5ºC). The transfer to the Neonatal Unit may be done using kangaroo method with the father if so desired.
- The rest of the cases (non-vigorous newborn or gestational age below 32.0 weeks) will be transferred from the delivery room to the neonatal resuscitation room for assessment by neonatology.