as respiratory distress syndrome with hyaline membrane formation [escape of plasma proteins into the alveoli] and secondary atelectasis [collapse of alveoli].

Meanwhile, a raised central venous pressure impedes the pulmonary lymphatic drainage of lung fluid, a situation that will be exacerbated if the infant is resuscitated or nursed in the head-down position.[1–3] Even a term infant—normally so resilient—may be seriously compromised.

During passage through the birth canal, a transfer of blood takes place from the baby to the placenta. This feto-placental transfusion blood, together with a portion of the normal placental blood volume, then returns to the baby following delivery, and has an important role to play in normal adaptation.

But early cord occlusion interrupts this process, trapping around 100 ml more blood in the placenta than would be the case if cord-clamping were deferred until cord pulsation had ceased. As 100 ml of blood in the term fetus is equivalent to 2.5 pints of blood in an adult, it is not surprising to observe that, following immediate cord occlusion, the newborn infant typically exhibits signs of hypovolaemia [too-low blood volume due to excess fluid loss] and hypotension [an excessively low blood pressure].[2–8]

The International Federation of Gynecology and Obstetrics (FIGO) Committee for the Ethical Aspects of Human Reproduction and Women's Health considered the ethical aspects of cord-blood collection at their meeting in Cairo in 1998. Their conclusion was as follows:[9]

"The information mothers currently receive at the time of requesting consent (for the collection of umbilical cord blood) is that blood in the placenta is no longer of use to the baby and this 'waste blood' may help to save another person's life. This information is incomplete and does not permit informed consent. Early clamping of the umbilical cord following vaginal delivery is likely to deprive the newborn infant of at least a third of its normal circulating blood volume, and it will also cause a haemodynamic disturbance. These factors may result in serious morbidity [illness].

"For consent to be informed, the harmful effects of early cord clamping should be disclosed and the mother assured that the collection of cord-blood will not involve early clamping. In summary, permission to collect blood from the cord for banking should not lead to clamping the cord earlier than 20–30 seconds after delivery of the baby."

So, in conclusion, women, when being requested to consent to the collection of blood for banking, should be made aware of this sound FIGO advice and assured that the umbilical cord will not be clamped for at least 20–30 seconds after delivery—to give the baby a chance to breathe and to receive a partial placental transfusion and, therefore, become normovolaemic [regain normal blood volume] by regaining the blood that had temporarily been 'lost' by the transfer of blood to the placenta during the second stage of delivery.

Late cord-clamping

Some mothers may indicate that they do not wish the umbilical cord to be ligated until after all pulsation has ceased. Such a situation may involve a delay of 10 minutes or more. While the practice has the advantage of avoiding interruption of the transitional placental circulation following birth, it may interfere with obstetric management of the third stage of labour and complicate resuscitation, should the baby fail to breathe spontaneously.

In addition, late cord-clamping with the placenta still within the uterus will lead to a full placental transfusion. As a result, the infant may become polycythaemic [when blood becomes tacky and doesn't circulate well due to an excess number of red blood cells], a complication associated with blood hyperviscosity and hyperbilirubinaemia [significant jaundice].

In ideal circumstances, the mother delivers in the upright position. With the mother still kneeling, the placenta—made smaller by the transfusion of blood into the baby—will usually be delivered within a few minutes to lie alongside the baby. By this time, respiration will have been established. If as a result of a large placental transfusion the baby's circulation is hypervolaemic, then excess blood may find its way back from the baby into the placenta. When umbilical cord pulsation has ceased, ligation and division of the umbilical cord may safely proceed.[10]

As those collecting cord-blood for banking purposes prefer aliquots of 100 ml or more, it is most unlikely with delayed cord-clamping that the placenta will retain an adequate volume for their needs.

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