Childbirth protocol and the lungs

I first saw the instruction to clamp the umbilical cord immediately at birth in Turrentine (2003), the second edition of his book on obstetric protocols [1]. I then learned that this was a restatement of ACOG Committee Opinion 138, published in 1994 [2], which several people had tried to get revoked [3]. Then 12 years later ACOG Committee Opinion 348 was published [4]. I submitted a letter-to-the-editor, which I was told was sent to the ACOG department responsible for Committee Opinions, and that I would receive correspondence from them, but I have not heard from them.

The assumption, clearly, is that following birth the lungs should be ready to take in air, and that filling the alveoli with air will initiate circulation to the lungs. Redmond et al. (1965) were able to provide dramatic evidence that a smaller amount of blood remained in the placentas of babies who breathed before clamping of the umbilical cord [5]. Philip (1973) using a different method (postnatal hematocrit) confirmed the findings of Redmond et al., stating:

“The combination of two easily obtained measures (RPBV and hematocrit change) provides adequate evidence of the occurrence of a placental transfusion, which appears to be strongly influenced by the onset of respirations.” [6, p342]

However, the results of both measurement of residual placental blood volume (RPBV) and postnatal hematocrit could be viewed in terms of Jäykkä’s finding that the alveoli open and become functional after their surrounding capillaries have filled with blood [7]. Jäykkä’s work hopefully will begin to regain better recognition following citation by Mercer and Skovgaard (2002), Wardrop and Holland (1995), Kinmond et al. (1993), and others [8-10]

It is recognized that the lungs of premature infants may not be sufficiently well developed. Prenatal corticosteroids are given to mothers at risk for premature labor, and surfactants are administered to premature newborns [11-13].

Increasing use of the clamp in the decades following its introduction may be responsible for increasing rates of respiratory distress syndrome (RDS). Landau et al. (1950) cited the textbook description by DeLee and Greenfield (1947) of the surgical technique employed in cesarean deliveries, which included immediate clamping of the cord [14, 15]. At this point in time (mid 20th century), most obstetricians followed the textbook instruction to wait for an infant to be breathing before clamping the cord. Landau et al. expressed concern over the immediate clamping of the cord during cesarean birth:

“This is in marked contrast to the procedure during normal or vaginal delivery. At this time the cord is not clamped and severed until pulsations have ceased. While the uterus is contracting down and the cord is pulsating, a considerable amount of blood is being propelled into the newly born infant's circulation.” [14, p423]
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Landau et al. (1950) devised a technique for hanging the placenta above babies born by cesarean section to allow drainage of blood from the placenta into the baby before clamping the cord. They concluded:

“From our observations we feel that the immediate clamping and cutting of the umbilical cord depriv[es] the newborn cesarean infant of a considerable amount of blood. The clinical course of these infants is similar to that of older patients in shock from blood loss.” [8, p424]

In 87 cesarean deliveries followed by suspension of the placenta to promote transfer of blood to the infant, there were no instances of postnatal respiratory distress. Landau et al. therefore decided against a control series with the standard practice of immediate clamping of the cord. Secher and Karlberg (1962) likewise devised means to provide postnatal placental transfusion to babies born by cesarean section.

References

11. ACOG Committee on Obstetric Practice. ACOG Committee Opinion No. 402: Antenatal corticosteroid therapy for fetal maturation.