Leaving well alone: a natural approach to the third stage of labor

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Abstract

Medical management of the third stage of labor—the time between birth of the baby and birth of the placenta—has become routine in recent times, especially the use of 'active management of the third stage' to prevent postpartum hemorrhage. This paper critiques the components of active management (use of an oxytocic drug to contract the new mother's uterus; early clamping of the baby's cord; controlled cord traction to deliver the baby's placenta) from the perspective of both mother and baby.

In particular, the author presents evidence that early cord clamping deprives the newborn baby of up to 50% of blood volume; possible health sequelae are discussed. The research on early clamping and effects such as jaundice and polycythemia are presented and critiqued.

For the mother, factors in modern obstetric care that contribute to the risk of postpartum hemorrhage are discussed. These include interventions such as induction, epidurals, forceps and caesarean surgery. The components of active management and their effects on the mother are critiqued from a physiological and hormonal perspective.

The author argues that third stage will be optimized through attention to the physiology and especially the psycho-hormonal aspects of this unique time. Recommendations include freedom for the mother to choose her position for birth and delivery of the placenta; ensuring a warm, private and undisturbed atmosphere for the first meeting of mother and baby; delayed cord clamping until delivery of the placenta; and not separating mother and baby.

Keywords: third stage of labor, postpartum hemorrhage, oxytocic drugs, cord clamping, active management of third stage

1. Birth in the twenty-first century

Pregnancy and birth have become medicalised to an extreme extent in the twenty-first century. This medicalisation has become so habitual in our culture that we have forgotten the more simple way of birth of our ancestors; a way that has ensured our survival as a species for millennia, and that is genetically encoded in our bodies.

Our genetic code for birth is rich and accurate, and has evolved to reflect the most efficient and effective means of human reproduction, including optimal outcomes for mother and baby in the short, medium and long-term. These outcomes are mediated by the mother's hormones and instincts, which influence her emotions and behaviours, from preconception (with her choice of mate) through to pregnancy, birth and mothering. Above all, this code, and the events that it triggers, is directed towards the formation of a secure bond between mother and offspring. This bond ensures optimal nourishment, protection, and care for the growing baby and is, historically and still today, the basis of human survival.

Although well intentioned, modern obstetrics has not honoured this genetic code. In the rush to protect mothers and babies from misfortune and death, obstetrics has ignored the powerful influences of the birthing mother's hormones, emotions and instinctive behaviours, even as researchers struggle to understand their complexity.

This neglect of the emotional and instinctive aspects of pregnancy and birth, which is culturally unprecedented, has major consequences for mothers and babies and, as I discuss elsewhere [1], may be a root cause of many of our culture's most pressing social and political problems. During the third stage of labour, when mother and baby meet for the first time, the gap between our genetic code and our culture's usual birthing practices is especially wide.

At a time when Mother Nature prescribes awe and ecstasy, we have injections, examinations, and clamping and pulling on the cord. Instead of body heat, skin-to-skin contact, and the baby's innate instinct to find the breast, we offer separation, wrapping, and outside assistance to 'attach' the baby. Where time should stand still for those eternal moments of first contact as mother and baby fall deeply in love, we have haste to deliver the placenta and clean up for the next case.

Medicalised management of the third stage—the time between the birth of the baby and delivery of the placenta—has been taken even further in recent years with the popularity of active management of the third stage. While much of the activity is designed to reduce the risk of maternal bleeding or postpartum haemorrhage (PPH), which is certainly a serious event, it seems that, as with the active management of labour, the medical approach to labour and birth may actually lead to many of the problems that active management is designed to address.

Active management also creates specific problems for mother and baby. In particular, active management can lead to the deprivation of up to half of a newborn's expected blood volume. When active management is used this extra blood, which is intended to perfuse the newly functioning lungs and other vital organs, is discarded along with the placenta. Possible sequelae include breathing difficulties and anaemia, especially in vulnerable babies; long-term effects on brain development are also very plausible.

The drugs used in active management have well-documented, and potentially serious, risks for the mother, which are further explored here. Active management also poses risks to the baby, as below, and we do not know the long-term

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effects of these drugs, which are given at a critical stage of brain development.

2. Hormones in the third stage

As a mammalian species—defined by our mammary glands and the milk that they produce for our young—we share almost all features of labour and birth with our fellow mammals. We also have in common the complex orchestration of labour hormones, produced deep within our middle (mammalian) brain, which co-ordinate these processes and ultimately ensure the survival and well-being of mother and baby [1].

For example, the hormone oxytocin causes the uterine contractions that signal labour, and helps us to enact our instinctive mothering behaviours. Endorphins, the body's natural opiates, produce an altered state of consciousness and aid us in transmuting pain; and the fight or flight hormones adrenaline and noradrenaline (epinephrine and norepinephrine, also known as catecholamines or CAs) give us the burst of energy that we need to push our babies out. These hormones continue to play crucial roles for mother and baby during the third stage.

At this time, the new mother's uterus continues to contract strongly and regularly under the continuing influence of oxytocin. Her uterine muscle fibres shorten (retract) with each contraction, leading to a gradual decrease in uterine size, which helps to shear the baby's placenta away from its attachment site. Efficient uterine contractions are also necessary to slow bleeding from the placental site, which is initially a large and raw surface. These contractions cause a tightening of the interlacing muscle fibres in the new mother's uterus (also called living ligatures), which seal off the placental blood vessels and stop bleeding. Third stage is complete when the placenta is delivered.

For the new mother, the third stage is a time of reaping the rewards of her labour. Mother Nature provides peak levels of oxytocin, the hormone of love; and endorphins, hormones of pleasure, for both mother and baby. Skin-to-skin contact and the baby's first attempts to breastfeed further augment maternal oxytocin levels [2], strengthening the uterine contractions that will help the baby's placenta to separate and the mother's uterus to contract down. In this way, oxytocin acts to prevent haemorrhage, as well as to establish, in concert with the other hormones, the close bond that will ensure a secure bond between mother and baby.

The fight-or-flight, or CA, hormones are also important at this time. These hormones are normally produced under conditions of fear, stress, anxiety, hunger, and cold, when they prepare the body for flight or fight through supplying extra blood to skeletal muscles, heart and lungs. Early in labour, if the mother is fearful or anxious, the release of these hormones will inhibit oxytocin and so slow her contractions.

During an undisturbed birth, however, the mother's CA levels will substantially increase with the transition from first to second (pushing) stage, giving her the extra strength that she needs to be upright and to push her baby out. This large increase in CA hormones also causes, paradoxically at this time, an outpouring of oxytocin that creates several strong contractions that help her to give birth quickly and easily. High CA levels also ensure that mother and baby are wide-eyed and alert at first contact.

Within minutes of birth, the new mother's CA levels start to decline and, at these lower levels, revert to their original negative influence on oxytocin. A warm and calm atmosphere is needed to keep CAs declining and oxytocin levels unopposed.

If the new mother feels cold or fearful her CA levels will remain elevated, which will decrease her oxytocin and therefore the ability of her uterus to contract and stop bleeding at this critical time. She may shiver, giving warning of this danger and requiring urgent action to warm her up. Elevated CA levels at this time have been linked in research with a higher risk of PPH [3,4], and lower oxytocin levels have been associated with third stage problems [5].

For safety, therefore, the new mother needs a situation that will optimise her oxytocin release and minimise her CA release for the first hour or so after birth. This includes a warm, safe and private atmosphere, where the new mother has nothing to do but touch and gaze at her baby who is skin-to-skin and free to explore the mother's body and breasts.

The new baby also enjoys peak hormone levels in the minutes after birth, including oxytocin, beta-endorphin and catecholamines. As with the mother, the reduction of CA hormones post-birth is vital. If these hormones are not soothed by contact with the mother, the baby can go into a state of stress-induced shock, which, according to author Joseph Chilton Pearce, will prevent the activation of the specific brain functions that are Nature's blueprint for this time [6]. Pearce believes that the separation of mother and baby after birth is "…the most devastating event of life, which leaves us emotionally and psychologically crippled [7]."

One might wonder whether the modern epidemic of stress (a term that was invented by researchers in the 1950s) and stress-related illness in our culture is a further outcome of current third-stage practices.

It is scientifically plausible that our entire hypothalamic-pituitary-adrenal (HPA) axis, which mediates both short-term fight-or-flight reaction as well as long-term stress responses and immune function, could be permanently mis-set by the continuing high stress hormone levels that ensue when newborn babies are routinely separated from their mothers. Carter comments 'There is increasing evidence for tuning or programming of neuronal (brain/nerve) systems by early experiences, in some cases by endogenous (internal) or exogenous (external) hormones [8].

Odent notes that almost every existing culture has rituals that disturb the early post-natal time—most often by separating mother and baby—and he believes that such rituals have predominated because they instil aggressive, and therefore more dominating and successful, traits in the offspring and culture. For example, Spartan warriors-to-be were apparently thrown on the floor after birth [9]. One must also wonder about the effects, on the newborn male and on our society, of the postnatal ritual of circumcision.

Research by Jacobson [10-12] and Raine [13], among others, suggests that contemporary tragedies such as suicide, drug addiction and violent criminality may be linked to problems in the perinatal period such as exposure to drugs, birth complications and separation or rejection from the mother.

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A crucial role for birth attendants in these times, therefore, is to ensure that a woman's mammalian instincts are valued and protected during pregnancy, birth and the postnatal time. Ensuring unhurried and uninterrupted contact between mother and baby after birth; adjusting the temperature to maintain warmth for mother and baby; facilitating skin-to-skin contact and early breastfeeding; and not removing the baby for any reason; these are all practices that are sensible, intuitive and safe. These practices also help to synchronise our hormonal systems with our genetic blueprint, giving maximum success and pleasure for both partners in the critical function of child rearing.

3. Placental transfusion and the baby

Adaptation to life outside the womb is the major physiological task for the baby in third stage. In utero, the wondrous placenta fulfils the functions of lungs, kidney, gut, skin and liver for our babies. Blood flow to these organs is minimal until the baby takes a first breath, at which time huge changes begin in the organisation of the circulatory system.

Within the baby's body, blood becomes diverted away from the umbilical cord and placenta over several minutes and, as the baby's lungs fill with air, blood is sucked into the pulmonary (lung) circulation [14]. Mother Nature ensures a reservoir of blood in the cord and placenta that provides the additional blood necessary for the perfusion of these pulmonary and organ systems.

The transfer of this reservoir of blood from the placenta to the baby happens in a stepwise progression, with blood entering the baby during each third-stage contraction, and some blood returning to the placenta between contractions. Crying slows the intake of blood, which is also controlled by constriction of the vessels within the cord [15], both of which imply that the baby can regulate the transfusion according to their individual need.

Gravity will affect the transfer of blood, with optimal transfer occurring when the baby remains at or slightly below the level of the uterus, until the cessation of cord pulsation signals that the transfer is complete. This process, sometimes called physiological clamping, typically takes three minutes but it may take longer, or alternatively may be complete in only one minute [16].

This elegant and time-tested system, which ensures that an optimum but not a standard amount of blood is transferred, is rendered inoperable by the current practice of early clamping of the cord, which usually occurs within 30 seconds of birth.

4. Early clamping and the Baby

Early clamping has been widely adopted in Western obstetrics as part of the package known as active management of the third stage. Active management includes the use of an oxytocic agent—a drug that, like oxytocin, causes the uterus to contract strongly—which is usually given by injection into the mother's thigh as the baby is born. Active management also includes early cord clamping and controlled cord traction; that is, pulling on the cord to deliver the placenta as quickly as possible.

Active management proponents have believed that if the cord is not clamped before the oxytocic effect commences, the baby is at risk of having too much blood pumped from the placenta by the stronger uterine contractions. In fact, the oxytocic drug will hasten the baby's placental transfusion, however, as research using the oxytocic drug methylergometrine has shown, the baby does not get too much blood [17].

And while the aim of active management is to reduce the risk of haemorrhage for the mother, '…its widespread acceptance was not preceded by studies evaluating the effects of depriving neonates [newborn babies] of a significant volume of blood [18].

Usher estimated that early clamping deprives the baby of 54 ml to 160 ml of blood [19], which represents up to half of a baby's total blood volume at birth. Average placental transfusion is 100 ml, and an average newborn's total blood volume is 350 ml.

Morley comments, "Clamping the cord before the infant's first breath results in blood being sacrificed from other organs to establish pulmonary perfusion [blood supply to the lungs]. Fatality may result if the child is already hypovolemic [low in blood volume] [20]."

Peltonen recorded an early-clamped newborn's heart function as the baby took a first breath [21]. This film showed that, for several cardiac cycles after the first breath, the baby's left heart had insufficient blood. Peltonen concludes, "It would seem that the closing of the umbilical circulation before the aeration of the lungs has taken place is a highly unphysiological measure and should be avoided [22:142]."

5. Caesarean babies

Where the baby is lifted well above the uterus before clamping—for example during caesarean surgery—the mother's uterus may be unable to pump blood against the uphill gradient; caesarean babies are therefore especially liable to receive less than their expected blood volume. The consequence of this may be an increased risk of respiratory (breathing) distress. Several studies have shown that respiratory distress can be eliminated in caesarean-born babies when a full placental transfusion is allowed [21,23].

UK paediatrician Peter Dunn recommends that the cord of caesarean babies remains unclamped, and that, after removal from the mother's uterus, the baby and conjoined placenta remain level until the cord stops pulsing in 5 to 10 minutes [24]. The naked baby and wrapped placenta could also be placed on the mother's chest. Morley has similar recommendations for caesarean babies [25]. Other researchers have hung the baby's placenta like a transfusion bag until the cord stops pulsating [23].

6. Reduced iron and other early clamping sequelae

The baby whose cord is clamped early also loses the iron contained within that blood; early clamping has been linked with an increased risk of anaemia in infancy. A recent review suggests that delayed cord clamping reduces the risk of anaemia by 15% at two to three months, for babies in both developing and industrialised countries [26]. The 30-35mg of additional iron in an average placental transfusion is equivalent to the amount of iron in 100 litres of breast milk [27].

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These sequelae of early clamping were recognised as far back as 1801, when Erasmus Darwin wrote: "Another thing very injurious to the child is the tying and cutting of the navel string too soon; which should always be left till the child has not only repeatedly breathed but till all pulsation in the cord ceases. As otherwise the child is much weaker than it ought to be, a part of the blood being left in the placenta which ought to have been in the child [28]."

In one study, premature babies who experienced a delay in cord clamping of only 30 seconds showed a reduced need for transfusion, less severe breathing problems, better oxygen levels and indications of probable improved long-term outcomes compared with those whose cords were clamped immediately [29].

One must also wonder about the effects of the deprivation of a significant amount of blood on the newborn baby's brain. Some have suggested that some of our children's developmental problems, such as cerebral palsy [20], autism [31] and learning difficulties [32], may be related to the practice of early cord clamping, which has only been widespread in the last 50 years or so [33].

Mercer and Skovgaard also document the elegant unfolding of the newborn's lungs that occurs at birth, and that ensures a safe transition to breathing [34]. This unfolding requires an adequate blood (and red blood cell) volume, which comes from an adequate placental transfusion. Their paradigm also explains the reason for the wet lungs that are more likely for caesarean babies, who are deprived of their full placental transfusion, and is another powerful argument for leaving well alone in the third stage.

7. Polycythemia and jaundice

Some studies have shown an increased risk of polycythemia (more red blood cells in the blood) and jaundice when the cord is clamped later. Polycythemia may be beneficial, in that more red cells will be able to supply more oxygen to the newborn's organs and tissues, and the higher levels of protein contained in this blood is also advantageous in drawing fluid from the newborn lungs, so preventing wet lungs [34].

The idea that polycythemia will cause the blood to become too thick (hyperviscosity syndrome), which is often used as an argument against delayed cord clamping, arose from two old and poorly validated trials involving small numbers of babies, some of whom were premature [35,36]. This finding has not been substantiated in more recent high-quality research [37]. It is also illogical, as the circulatory system of a health newborn can compensate easily by dilating the blood vessels to accommodate higher viscosity blood [37,38]. As with all mammalian species, our babies' circulatory systems are designed to compensate this normal adjustment to life outside the womb.

Jaundice is almost certain when a baby gets his or her full quota of blood, and is caused by the breakdown of red blood cells to produce bilirubin, the pigment that causes the yellow appearance of a jaundiced baby. Physiological jaundice—that is, jaundice due only to the normal breakdown of excess red blood cells—is present in almost all human infants to some extent, and may be prolonged by breastfeeding (breast milk jaundice).

Our understanding of jaundice has increased recently, with bilirubin—which has been called a 'born-again benignant pigment' [39]—now recognised as an important anti-oxidant, more powerful than vitamin E [40]. Bilirubin may have a critical role in protecting the newborn baby from oxidative stresses associated with adjustment to life outside the womb. An older study also found that bilirubin has antibiotic properties sufficient to kill the pneumococcal bacteria [41].

A recently published 15-year follow-up of babies with severe jaundice—bilirubin levels much higher than would be present in physiological jaundice—concluded, "Neonatal bilirubin levels seem to have little effect on IQ, definite neurologic abnormalities, or hearing loss. Higher bilirubin levels are associated with minor motor abnormalities, but the clinical importance of this finding is limited by the weakness of the association, the mild nature of the abnormalities, and the lack of evidence that they are prevented by treatment [42]."

Studies do not show an excess of severe jaundice in babies who have had late clamping.

Early cord clamping carries the further disadvantage of depriving the baby of the oxygen-rich placental blood that Mother Nature provides to tide the baby over until breathing is well established. In situations of extreme distress—for example, if the baby takes several minutes to breathe—this reservoir of oxygenated blood can be life saving. Standard practice is to cut the cord immediately if resuscitation is needed, but resuscitation can be performed on the mother's thigh, with the baby's placental circulation still intact.

When the cord is intact, the placental circulation also acts as a conduit for any drugs given to the mother, whether during pregnancy, labour, or third stage. Garrison reports a positive use for this conduit [43]. He notes that naloxone (Narcan)—which is sometimes needed by the baby to antidote the sedating effect of opiate drugs given to the mother in labour, such as pethidine (meperidine)—can be administered effectively via the mother's veins in third stage, flowing to and waking up the newborn baby in a matter of seconds.

8. Cord blood harvesting

The recent discovery of the amazing properties of cord blood, in particular the stem cells contained within it, heightens, for me, the need to ensure that a newborn baby gets a full quota. Newborn stem cells are unique to this stage of development, and will migrate to the baby's bone marrow soon after birth, transforming themselves into various types of blood-making cells.

So-called cord blood harvesting, which actually involves collecting the baby's placental blood store, requires immediate clamping, with up to 100 ml or more of this extraordinary blood taken from the newborn baby to whom it belongs. In many public hospitals, altruistic cord blood donation is being promoted to fill cord blood banks for the future treatment of individuals with leukaemia. In other places, private cord-blood banks are exhorting parents to pay large sums of money to store their baby's blood for future use, although the chance of the blood being useful for the child or family is very remote [44].

A single collection of 100 ml cord blood is equivalent to the loss of 1.5 to 2 litres of adult blood. Perhaps this is justifiable

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where active management is practiced and the blood otherwise would be discarded, but unfortunately, cord blood donation is incompatible with a physiological (natural) third stage.

9. Synthetic oxytocin and the baby

Lastly, the baby exposed to active management may also be affected by maternal administration of synthetic oxytocin during the third stage. Carter, who has found disturbances in adult sexual and parental behaviour in prairie voles administered a single dose of synthetic oxytocin within 24 hours of birth, suggests that small amounts may cross the human placenta, or alternatively there may be indirect effects [45]. She cautions, "The assumption that perinatal oxytocin manipulations are without effect is largely untested, although the small but growing literature in animals suggests that this may be an invalid assumption [46:392]."

A final consideration is the possibility that, as Edwards cautions 'though very rare, injections can be mixed up [47].' There are case reports of oxytocic drugs being accidentally given to newborns instead of Vitamin K [48,49].

10. Active management and the mother

Active management (oxytocic, early clamping and controlled cord traction) represents a further development in third-stage interference, which began in the mid-17th century when male attendants began confining women to bed and cord clamping was introduced to spare the bed linen [50].

Pulling on the cord was first recommended by Mauriceau in 1673, who feared that the uterus might close before the placenta was spontaneously delivered [50]. In fact, the bed-bound horizontal postures increasingly adopted under medical care meant that spontaneous delivery of the placenta was less likely: an upright posture, which women and midwives have traditionally used, encourages the placenta to fall out with the help of gravity.

The first oxytocic to be used medically was ergot, derived from a fungal infection of rye. Ergot was used by 17th and 18th century European midwives; its use was limited, however, by its toxicity. It was refined and revived as ergometrine (ergonovine US) in the 1930s, and by the late 1940s, some doctors were using it preventatively, as well as therapeutically, for postpartum haemorrhage [50].

Potential side effects from ergot derivatives include a rise in blood pressure, nausea, vomiting, headache, palpitations, cerebral haemorrhage, cardiac arrest, convulsion and even death.

Synthetic oxytocin, known as Syntocinon or Pitocin (US), mimics the effects of natural oxytocin on the uterus, and was first marketed in the 1950s. Synthetic oxytocin has largely replaced ergometrine for use in third stage, although a combination drug called syntometrine is still used, especially for severe haemorrhage. Syntocinon causes an increase in the strength of contractions, whereas ergometrine causes a large continuous (tonic) contraction, which significantly increases the chance of trapping the placenta. Ergometrine also interferes with the process of placental separation, increasing the chance of partial separation [51].

In recent years, misoprostol, a synthetic prostaglandin, has also been researched for use in the third stage. Misoprostol is cheap and can be given orally, which makes it attractive for low-resource settings. Evidence suggests that it is less effective as a preventative than other oxytocic drugs, with more side-effects such as nausea, vomiting, diarrhea, fever and shivering [52]. However, it may be a useful drug for treatment of PPH, and less misoprostol is transferred to breast milk, compared to ergot derivatives [53].

11. Active management trials

Active management has been proclaimed '…the routine management of choice for women expecting a single baby by vaginal delivery in a maternity hospital' [54], largely because of the results of the 1998 Hinchingbrooke trial [55] comparing active and expectant (non-active, or physiological) management.

In this trial, which involved only women at low risk of bleeding, active management was associated with a postpartum haemorrhage (blood loss greater than 500 ml) rate of 6.8 percent, compared with 16.5 percent for expectant management. Rates of severe PPH (blood loss greater than 1000 ml) were low in both groups: 1.7 percent active and 2.6 percent expectant.

The authors' note that, based on these figures, ten women would need to receive active management to prevent one PPH. They comment, "Some women … may rate a small personal risk of PPH of little importance compared with intervention in an otherwise straightforward labour, whereas others may wish to take all measures to reduce the risk of PPH [56:698]."

Reading this paper, one must wonder how it is that almost one in six women bled after physiological management, and whether one or more components of Western obstetric practices might actually increase the rate of haemorrhage.

Botha, who attended more than 26,000 Bantu women over the course of 10 years, reports, '…a retained placenta was seldom seen … Blood transfusion for postpartum haemorrhage was never necessary [57].' Bantu women deliver both baby and placenta while squatting, and the cord is not attended to until the placenta is delivered by gravity.

12. PPH and the mother

Some evidence shows that the practice of clamping the cord, which is not practiced by indigenous cultures (or obviously by other mammals), contributes both to PPH and retained placenta by trapping extra blood within the placenta. This increases placental bulk, which the mother's uterus cannot contract (and retract) efficiently against and which can lead to increased blood loss [58]. The maternal effects of cord clamping are the subject of a forthcoming Cochrane Database review [59].

Other Western practices that may contribute to PPH include the use of oxytocin for induction and augmentation (acceleration) of labour [60-63], episiotomy, perineal trauma, forceps delivery, caesarean and previous caesarean, which increases the risks of placental problems such as placental abruption and placenta praevia [64-66].

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Gilbert notes that PPH rates in her UK hospital more than doubled, from 5 percent in 1969-70 to 11 percent in 1983-5, and concludes, "Changes in labour ward practice over the last 20 years have resulted in the re-emergence of PPH as a significant problem [67]."

In particular, she links an increased risk of bleeding to the following: induction using oxytocin; forceps delivery; long first and second stages (but not prolonged pushing); and epidurals, which increase the chances of a long second stage and/or forceps. The prolonged use of synthetic oxytocin for labour induction or augmentation (acceleration) has been shown to desensitise the labouring mother's uterus to the effects of oxytocin by reducing her number of oxytocin receptors [68].

As noted, Western practices neither facilitate the production of a mother's own oxytocin, nor pay attention to reducing catecholamine levels in the minutes after birth, both of which will physiologically improve uterine contractions and therefore reduce haemorrhage.

It is also interesting to note Logue's finding of a significant difference in PPH rates according to the practitioner [69]. In the hospital surveyed, PPH rates varied between 1-16% for midwives and 1-31% for registrars. She notes that doctors and midwives who were considered to be 'heavy handed' had much higher rates.

13. Early clamping and the mother

Clamping the cord, especially at an early stage, may also cause the extra blood trapped within the placenta to be forced back through the placenta into the mother's blood supply during the third stage contractions [70,71].

This fetomaternal hemorrhage increases the chance of future blood group incompatibility problems, which occur when the current baby's blood enters the mother's bloodstream and causes an immune reaction that can be reactivated in a subsequent pregnancy, destroying the next baby's blood cells and causing anaemia or even death. Major reactions due to Rh group incompatibility can be prevented by the routine use of anti-D products such as RhoGAM, which are very effective but, because they are blood products, carry other potential risks.

The use of oxytocic drugs, either during labour or in third stage, has also been linked to an increased risk of fetomaternal hemorrhage and blood group incompatibility problems [72,73], because the stronger uterine contractions can cause microfractures in the placental barrier [72]. (Note that these areas have been poorly researched since the widespread use of Anti-D, which protects against the major cause of blood group incompatibility.)

Cord traction also carries potential hazards. When the baby's placenta is not yet separated, strong cord traction can actually pull off the cord, making placental delivery more difficult and surgery for removal more likely. Cord traction is also a painful procedure for the new mother. Strong cord traction can also, rarely, cause an inversion of the new mother's uterus, which produces a profound state of shock.

The World Health Organization, in its 1996 publication Care in Normal Birth: a practical guide, considers these risks and concludes: "In a healthy population (as is the case in most developed countries), postpartum blood loss up to 1000 ml may be considered as physiological and does not necessitate treatment other than oxytocics… [74]."

"In relation to routine oxytocics and controlled cord traction, WHO cautions: Recommendation of such a policy would imply that the benefits of such management would offset and even exceed the risks, including potentially rare but serious risks that might become manifest in the future [75]."

14. Recent developments in third stage management

In the five years since this article was first published, there have been some welcome developments in the thinking and practice of third stage. US authors Morley [25], Mercer [34,37] and others have published papers that have deepened our understanding of neonatal physiology during third stage and of the risks of early clamping for the baby.

In the UK, the influential Cochrane database, the best source of evidence-based medicine, has reviewed the literature on early versus delayed umbilical cord clamping in preterm infants, and concluded, "Delaying cord clamping by 30 to 120 seconds, rather than early clamping, seems to be associated with less need for transfusion and less intraventricular haemorrhage [76]."

The Canadian Pediatric Society has also recently recommended delayed cord clamping to reduce the need for blood transfusions in premature babies [77].

The Cochrane database has also published a recent review of the use of oxytocin for prevention in the third stage and, although noting a decrease in PPH have suggested that "...there is not enough evidence about adverse effects. More research is needed [78]."

It is also heartening to read the recent joint statement by the International Confederation of Midwives and the International Federation of Gynaecologists and Obstetricians, as part of the Safe Motherhood project. This statement advocates routine active management, but, in a major shift for ICM/FIGO, now recommends that the baby's cord should not be clamped until pulsation has ceased.

15. Choosing a natural third stage

A woman's choice to forego preventative oxytocics, to clamp late (if at all) and to deliver the placenta by her own effort all require forethought, commitment and the selection of birth attendants who are comfortable and experienced with these choices.

A natural third stage is more than this, however. We must ensure respect for the emotional and hormonal processes of both mother and baby, remembering how unique this time is. Odent stresses the importance of not interrupting, even with words, and believes that, ideally, the new mother should feel unobserved and uninhibited in the first encounter with her baby.

This level of non-interference requires skill, experience and confidence as well as support from mentors and institutions. However, as I argue, attention to these non-medical elements is essential for a safe natural third stage.

Lotus birth, in which the placenta remains attached to the baby until the cord separates naturally, gives us another way to 'slow the fire drill' after birth, as midwife Gloria Lemay puts it

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[80], and allows our babies the full metaphysical, as well as physical, benefit of prolonged contact with the placenta. Like a good midwife, lotus birth secludes mother and baby in the early hours and days, ensuring rest and keeping visitors to a minimum [81].

Third stage represents the first meeting between mother and baby, creating a powerful imprint upon their relationship. When both are undrugged and quiet, fully present and alert, new potentials for love and trust are invoked for mother, baby, family and the world we share.

References

[1] Buckley SJ. Undisturbed Birth: Nature's Blueprint for Ease and Ecstasy. Journal of Prenatal and Perinatal Psychology and Health, 2003; 17(4):261–288. (Updated version in Gentel Birth, Gentle Mothering in press.)

[2] Matthiesen AS, Ransjo-Arvidson AB, Nissen E, Uvnas-Moberg K. Postpartum maternal oxytocin release by newborns: effects of infant hand massage and sucking. Birth, 2001;28(1):13–9.

[3] Saito M, Sano T, Satohisa E. Plasma catecholamines and microvibration as labour progresses. Shinshin-Thaku, 1991;31:381–89.

[4] Odent M. Don't manage the third stage of labour! Pract Midwife, 1998; 1(9):31–3.

[5] Thornton S, Davison JM, Baylis PH. Plasma oxytocin during third stage of labour: comparison of natural and active management. Br Med J, 1988;297(6642):167–9.

[6] Pearce JC. Evolution's End: Claiming the Potential of Our Intelligence. San Francisco: HarperSanFrancisco, 1995.

[7] Pearce JC. Evolution's End: Claiming the Potential of Our Intelligence. San Francisco: Harper San Francisco, 1992:124.

[8] Carter CS. Developmental consequences of oxytocin. Physiol Behav, 2003;79(3):383–97..

[9] Odent M. The Scientification of Love. Revised ed. London: Free Association Books, 2001.

[10] Jacobson B, Eklund G, Hamberger L, Linnarsson D, Sedvall G, Valverius M. Perinatal origin of adult self-destructive behavior. Acta Psychiatr Scand, 1987;76(4):364–71.

[11] Jacobson B, Nyberg K, Gronbladh L, Eklund G, Bygdeman M, Rydberg U. Opiate addiction in adult offspring through possible imprinting after obstetric treatment. Br Med J, 1990;301(6760):1067–70.

[12] Jacobson B, Bygdeman M. Obstetric care and proneness of offspring to suicide as adults: case-control study. Br Med J, 1998;317(7169):1346–9.

[13] Raine A, Brennan P, Mednick SA. Birth complications combined with early maternal rejection at age 1 year predispose to violent crime at age 18 years. Arch Gen Psychiatry, 1994;51(12):984–8.

[14] Redmond A, Isana S, Ingall D. Relation of Onset of Respiration to Placental Transfusion. Lancet, 1965;17:283–5.

[15] Gunther M. The transfer of blood between baby and placenta in the minutes after birth. Lancet, 1957;272(6982):1277–80.

[16] Linderkamp O. Placental transfusion: determinants and effects. Clin Perinatol, 1982;9(3):559–92.

[17] Yao AC, Hirvensalo M, Lind J. Placental transfusion-rate and uterine contraction. Lancet, 1968;1(7539):380–3.

[18] Pisacane A. Neonatal prevention of iron deficiency. Br Med J, 1996; 312(7024):136–7.

[19] Usher R, Shephard M, Lind J. The Blood Volume of the Newborn Infant and Placental Transfusion. Acta Paediatr, 1963;52:497–512.

[20] Morley GM. Cord Closure: Can Hasty Clamping Injure the Newborn? OBG Management, July 1998;29–36.

[21] Peltonen T. Placental transfusion--advantage an disadvantage. Eur J Pediatr, 1981;137(2):141–6.

[22] Peltonen T. Placental transfusion--advantage an disadvantage. Eur J Pediatr, 1981;137(2):141–6,.

[23] Landau DB. Hyaline membrane formation in the newborn; hematogenic shock as a possible etiologic factor. Mo Med, 1953;50(3):183–5.

[24] Dunn P. Caesarean section and the prevention of respiratory distress syndrome of the newborn. Third European Congress of Perinatal Medicine; 1972; Lausanne. Hans Huber.

[25] Morley G. To Clamp or not to Clamp: This is the Answer. 2002. Available online at www.cordclamping.com.

[26] van Rheenen P, Brabin BJ. Late umbilical cord-clamping as an intervention for reducing iron deficiency anaemia in term infants in developing and industrialised countries: a systematic review. Ann Trop Paediatr, 2004;24(1):3–16.

[27] Zlotkin S. Current issues for the prevention and treatment of iron deficiency anemia. Indian Pediatr, 2002;39(2):125–9.

[28] Darwin E. Zoonomia or The Laws of Organic Life. Second ed. London: J Johnson, 1796.

[29] Kinmond S, Aitchison TC, Holland BM, Jones JG, Turner TL, Wardrop CA. Umbilical cord clamping and preterm infants: a randomised trial. Br Med J, 1993;306(6871):172–5.

[30] Morley G. Neonatal encephalopathy, Hypoxic Ischemic Encephalopathy, and Subsequent Cerebral Palsy: Etiology, Pathology and Prevention. 2003. Available online at www.cordclamping.com/Lancet2003 analysis.htm.

[31] Morley G. Autism, ADD/ADHD, and related disorders: Is a common childbirth practice to blame? Red Flags Weekly enewsletter 2002. Available online at http://redflagsweekly.com/features/Morley.html.

[32] Simon E. Developmental Language Disability: One consequence of ischemic brainstem injury? 31st Annual Meeting of the Fetal and Neonatal Physiological Society. Tuscany, 2004. Available on line at www.cordclamping.com/poster1.doc.

[33] Simon E. The History of Cord Clamping. 2004. Available online at www.cordclamping.com/History.htm.

[34] Mercer JS, Skovgaard RL. Neonatal transitional physiology: a new paradigm. J Perinat Neonatal Nurs, 2002;15(4):56–75.

[35] Saigal S, O'Neill A, Surainder Y, Chua LB, Usher R. Placental transfusion and hyperbilirubinemia in the premature. Pediatrics, 1972; 49(3):406–19.

[36] Saigal S, Usher RH. Symptomatic neonatal plethora. Biol Neonate, 1977;32(1-2):62–72.

[37] Mercer JS. Current best evidence: a review of the literature on umbilical cord clamping. J Midwifery Womens Health, 2001;46(6):402–14.

[38] Morley GM. Cord Closure: Can Hasty Clamping Injure the Newborn? OBG Management July 1998;29–36.

[39] McDonagh A. Bilirubin the beneficent. Pediatrics, 2004;114(6):1741-2; author reply 1742–3.

[40] Sedlak TW, Snyder SH. Bilirubin benefits: cellular protection by a biliverdin reductase antioxidant cycle. Pediatrics, 2004;113(6):1776–82.

[41] Najib-Farah. Defensive role of bilirubinemia in pneumococcal infection. Lancet, 1937;1:505–6.

[42] Newman TB, Klebanoff MA. Neonatal hyperbilirubinemia and long-term outcome: another look at the Collaborative Perinatal Project. Pediatrics, 1993;92(5):651–7.

[43] Garrison L. www.gentlebirth.org/archives/cordIssues.html, 1999.

[44] Steinbrook R. The cord-blood-bank controversies. N Engl J Med, 2004; 351(22):2255–7.

[45] Carter CS. Developmental consequences of oxytocin. Physiol Behav, 2003;79(3):383–97.

[46] Carter CS. Developmental consequences of oxytocin. Physiol Behav, 2003;79(3):383–97.

[47] Edwards NP. Delivering Your Placenta: The Third Stage: AIMS for British Maternity Trust, 1999.

[48] Hoff DS, Maynard RC. Accidental administration of oxytocin to a premature infant. Neonatal Netw, 2002;21(1):27–9.

[49] Brereteon-Stiles GG, Winship WS, Goodwin NM, Roos RF. Accidental administration of syntometrine to a neonate. S Afr Med J, 1972; 46(52):2052.

[50] Inch S. Birth Rights: What Every Parent Should Know About Childbirth in Hospital. New York: Random House, 1984.

[51] Sorbe B. Active pharmacologic management of the third stage of labor. A comparison of oxytocin and ergometrine. Obstet Gynecol, 1978; 52(6):694–7.

[52] Gulmezoglu AM, Forna F, Villar J, Hofmeyr GJ. Prostaglandins for prevention of postpartum haemorrhage. Cochrane Database Syst Rev, 2004(1):CD000494.

[53] Vogel D, Burkhardt T, Rentsch K, Schweer H, Watzer B, Zimmermann R, et al. Misoprostol versus methylergometrine: pharmacokinetics in human milk. Am J Obstet Gynecol, 2004;191(6):2168–73.

[54] Prendiville WJ, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour. Cochrane Database Syst Rev, 2000(3):CD000007.

doi: 10.1588/medver.2005.02.00063

[55] Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingbrooke randomised controlled trial. Lancet, 1998; 351(9104):693–9.
[56] Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingbrooke randomised controlled trial. Lancet, 1998; 351(9104):693–9..
[57] Botha M. Management of the Umbilical Cord During Labour. South African Journal of Obstetrics and Gynecology, 1968;6:30–33.
[58] Walsh SZ. Maternal effects of early and late clamping of the umbilical cord. Lancet, 1968;1(7550):996–7.
[59] Soltani H, Dickinson F, Symonds I. Placental cord drainage after spontaneous vaginal delivery as part of the management of the third stage of labour. The Cochrane Database of Systematic Reviews 2004; (1):CD004665.
[60] Phillip H, Fletcher H, Reid M. The impact of induced labour on postpartum blood loss. J Obstet Gynaecol, 2004;24(1):12–5.
[61] Stones RW, Paterson CM, Saunders NJ. Risk factors for major obstetric haemorrhage. Eur J Obstet Gynecol Reprod Biol, 1993;48(1):15–8.
[62] MacKenzie IZ. Induction of labour and postpartum haemorrhage. Br Med J, 1979;1(6165):750.
[63] Brinsden PR, Clark AD. Postpartum haemorrhage after induced and spontaneous labour. Br Med J, 1978;2(6141):855–6.
[64] Chattopadhyay SK, Kharif H, Sherbeeni MM. Placenta praevia and accreta after previous caesarean section. Eur J Obstet Gynecol Reprod Biol, 1993;52(3):151–6.
[65] Hemminki E, Merilainen J. Long-term effects of cesarean sections: ectopic pregnancies and placental problems. Am J Obstet Gynecol, 1996; 174(5):1569-74.
[66] Lydon-Rochelle M, Holt VL, Easterling TR, Martin DP. First-birth cesarean and placental abruption or previa at second birth(1). Obstet Gynecol, 2001;97(5 Pt 1):765–9.
[67] Gilbert L, Porter W, Brown VA. Postpartum haemorrhage--a continuing problem. Br J Obstet Gynaecol, 1987;94(1):67–71.
[68] Phaneuf S, Rodriguez Linares B, TambyRaja RL, MacKenzie IZ, Lopez Bernal A. Loss of myometrial oxytocin receptors during oxytocin-induced and oxytocin-augmented labour. J Reprod Fertil, 2000; 120(1):91–7.
[69] Logue M. The management of the third stage of labour: a midwife's view. J Obstet Gynaecol, 1990;10(Suppl 2):10–12.
[70] Ladipo OA. Management of third stage of labour, with particular reference to reduction of feto-maternal transfusion. Br Med J, 1972; 1(5802):721–3.
[71] Doolittle JE, Moritz CR. Prevention of erythroblastosis by an obstetric technic. Obstet Gynecol, 1966;27(4):529–31.
[72] Beer AE. Fetal erythrocytes in maternal circulation of 155 Rh-negative women. Obstet Gynecol, 1969;34(2):143–50.
[73] Weinstein L, Farabow WS, Gusdon JP, Jr. Third stage of labor and transplacental hemorrhage. Obstet Gynecol, 1971;37(1):90–3.
[74] World Health Organisation. Care in Normal Birth: a Practical Guide. Report of a Technical Working Group. Geneva: World Health Organisation, 1996:31.
[75] World Health Organisation. Care in Normal Birth: a Practical Guide. Report of a Technical Working Group. Geneva: World Health Organisation, 1996:32.
[76] Rabe H, Reynolds G, Diaz-Rossello J. Early versus delayed umbilical cord clamping in preterm infants. Cochrane Database Syst Rev, 2004(4):CD003248.
[77] Fetus and Newborn Committee CPS. Red blood cell transfusions in newborn infants: Revised guidelines. Paediatrics & Child Health, 2002; 7(8):553–8.
[78] Elbourne DR, Prendiville WJ, Carroli G, Wood J, McDonald S. Prophylactic use of oxytocin in the third stage of labour. Cochrane Database Syst Rev, 2001(4):CD001808.
[79] International Confederation of Midwives and International Federation of Gynaecologists and Obstetricians. Joint statement: management of the third stage of labour to prevent post-partum haemorrhage. J Midwifery Womens Health, 2004;49(1):76–7.
[80] Lemay G. Leaving the umbilical cord to pulse. Online Birth Centre News, 1999(14.8).
[81] Rachana S. Lotus Birth. Yarra Glen, Australia: Greenwood Press, 2000.

doi: 10.1588/medver.2005.02.00063