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ABSTRACT

This article contains a review of recent research on the: (1) effects of immediate post partum mother infant contact; (2) effects of early separation of parents and babies in neonatal intensive care; and (3) facilitation of reciprocal interaction between mothers and their infants in neonatal intensive care. A brief description of a study that would investigate the effects of an experimental intervention designed to facilitate synchronous interactions of mothers and their infants in neonatal intensive care units is also included. The proposed intervention would consist of using the Brazelton Neonatal Behavioral Assessment Scale to demonstrate to the experimental group of mothers the capabilities and individual strengths of their infants. (JMB)

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The notion of an optimal period soon after birth during which the human mother and infant are specially attuned to one another or biologically prepared to form an attachment bond has received both theoretical and empirical support (Bowlby, 1969; Kennell et al., 1975). As with other species, there is evidence of characteristic behaviors in humans which act as inducers of attachment, drawing the infant and mother together during this sensitive period. These behaviors have adaptive significance, especially for the human newborn who needs an extended period of care and protection. Such reciprocal attachment behaviors typically involve a complex meshing of specific infant capabilities and maternal motivational tendencies. For example, it has been shown that infants can discriminate and orient to speech stimuli. Moreover, they seem to prefer the high pitched voice of the female. Parents are responsive to this, using higher pitched voices to elicit the attention of the infant (Brazelton et al., 1975; Kennell et al., 1975; Klaus et al., 1975). As early as the first hour after birth, newborns can also make eye contact and follow movement of the human eyes and face (Brazelton et al., 1966). They prefer and respond differently to human faces than to inanimate objects (Brazelton, 1974). Parents, likewise, show interest in their infant's face and eyes, arranging themselves in a face-to-face position and attempting to gain or maintain eye

contact. Mothers often remark that their baby seems real as soon as they can see its eyes (Klaus et al., 1975; Kennell et al., 1975). Observations of mothers interacting with their newborns soon after birth have also revealed characteristic patterns of touching behavior that serve to eliciat reciprocal infant responses (Klaus et al., 1970; 1975).

Thus, it seems apparent that this period immediately following birth may be an ideal time for both mother and infant to begin reciprocal interaction. Certain maternal hormonal levels are elevated and perhaps as a consequence, the mother seems excited and eager for her infant to respond (Klaus and Kennell, 1976). Similarly, the normal fullterm unmedicated newborn is wide awake and receptive with strong reflexes and alert responses.

Early separation in normal and neonatal intensive care unit (NICU) babies

It is now recognized that separation of mother and infant during this sensitive newborn period prevents interaction and may to some extent impair the development of attachment. For example, Kennell et al. (1975) have found that mothers who have been separated from their newborns for as little as twenty-four hours often seem to lack confidence and skill in handling and report a lack of identification with their infants. Similar results have been obtained from studies which have examined the effects of separation versus extended contact during the days following birth (Barnett et al., 1970; Klaus et al., 1972; Kennell et al, 1974; de Chateau, 1976). In one study, a group of mothers were given their nude fullterm infants for one hour of contact within the two hours following birth and for five extra hours each day for three days

(Klaus et al., 1972). The control group received routine hospital contact: an introduction at delivery, brief contact at 6 to 8 hours, and then 20 to 30 minutes every four hours for feeding. The extended contact mothers showed more attachment behaviors and were generally more responsive to their infants at one month (Klaus et al., 1972) and again at one year (Kennell et al., 1974) than the limited contact mothers. Even at two years, a small sample of mothers from each group showed that the extended contact mothers were more verbally responsive to their children (Ringler et al., 1975).

Unfortunately, it is not always possible for mothers to achieve the extended contact with their newborns that is so beneficial for subsequent attachment. In particular, extended contact with premature or low birthweight (LBW) babies is often impossible. Advances in medical knowledge and technology in recent years have improved perinatal care and thereby reduced the mortality rate and incidence of serious handicaps among high risk and LBW newborns (Schlesinger, 1973; Reynolds and Stewart, 1975; Stewart and Reynolds, 1975). However, this situation has been achieved by the use of neonatal intensive care units (NICU) where infants are placed in incubators or attached to other life-preserving equipment in a relatively isolated environment. As a result, premature infants and their parents are separated for days, weeks and in some cases, months.

This physical separation is often exacerbated by an accompanying psychological separation between the parent and the NICU baby. Having a premature or handicapped infant may create feelings of guilt, fear and failure in the parent. In addition, the parents may feel that their expectations for a normal or "perfect" child have been destroyed, and they may react to this disappointment by

rejecting the infant or withdrawing from him/her (Klaus, 1975; Bentowim, 1972; 1975). Some parents may even fear the baby will die, and withdraw from the bby so as to ready themselves for its anticipated death. All of these factors can contribute to a situation in which the parent of a premature baby feels incapable of caring for the baby and afraid to even touch or hold him/her (Klaus, 1975). Furthermore, the premature baby is not capable of contributing as much to its caretaking environment as the healthy fullterm infant. Using the Brazelton Neonatal Behavioral Assessment Scale (Brazelton, 1973), Sepkoski, Garcia Coll and Lester (1976) found that a combination of risk factors, most significantly low birthweight, predicted worrisome scores on the dimensions of the scale: social processes, motoric processes, state organization and physiological organization. Thus, not only the parents' behavior, but also the infant's behavior could contribute to problems in the interaction. This is further evidence for the reasons why parents should be encouraged to interact with their infants in NICU.

We have found that even when parents are allowed and encouraged to visit their infants in NICU, very little actual interaction takes place. Investigations we have made have substantiated this lack of parental attention and contact that the infants in NICU receive. (Sepkoski, Eyler and Garcia Coll, in preparation). Each day for three weeks, we observed one hour time samples of each of the three work shifts at the NICU at Shands Teaching Hospital, University of Florida. During each hour of observation, we randomly selected three infants and recorded all adult contacts. A total of 189 baby-hours of observation were made. Duration of contact, the type of interaction (medical, caretaking, play, etc.) and adult (nurse,

mother, etc.) were recorded. The results showed that the average number of contacts received by a baby in an hour was six, for a total time of approximately eleven minutes, per infant per hour. Most of the interactions that took place (4.8 per hour) and most of the time spent with these infants (approximately 8 minutes per baby-hour) was initiated by the nurses of the NICU. Parents spent an average of only 20,6 seconds per hour with their infants. We could estimate, therefore, that over a 24 hour period, the parents of infants in this NICU spent only about 8 minutes with their infants! Approximately 6 of the 11 minutes per hour which these infants received of physical stimulation by adults involved medical care. An average of only 12.2 seconds per hour were spent in playful interaction. This is the very type of interaction which we believe is basic for the development of a satisfactory parent-infant bond.

Ther is also evidence showing that this separation and the accompanying distress of parents whose infants must stay in NICU may adversely affect the formation of a satisfactory attachment bond and may contribute to disorders of parenting with serious long-term consequences for the child and the family. Several investigations have reported that premature infants separated from their parents in early life represent a disproportionally high percentage of failure-to-thrive and battered children (Faranoff et al., 1972; Drillien, 1969). In one follow-up study of LBW (less than 1500 grams at birth) infants and their families, mothers had difficulties recognizing and responding to their babies' signals. They tended to be overprotective and anxious and their children as a group were shy, dependent and anxious (Blake et al.,1975).

Klaus and Kennell and their colleagues are among the first to systematically investigate the effects of separation versus extended contact between mothers and their premature infants (Kennell et al, 1975; Klaus et al, 1975). Clinical observations of mothers who have been separated from their premature infants have shown a decrement in the usual responses that mothers make when they first interact with their infants. In on case, when the period of separation lasted from one to three days, mothers who seemed fearful and awkward were slower to touch and encompass and to engage in eye contact with their infants (Klaus et al., 1975).

Kennell et al. (1975) permitted one group of mothers to come into the premature nursery as soon as possible and the other after the usual three week period. At discharge the early-contact mothers looked at their infants significantly more during feeding. At 42 months, infants in the early contact group scored significantly higher than the late-contact group on the Stanford Binet.

In a similar study by Leifer and colleagues (Leifer et al,, 1972) one group of mothers was separated form their premature infants for the usual 3 to 12 weeks while the other group was in contact once every six days. Both groups of mothers of prematures smiled and held their infants less often than mothers of fullterm newborns. There were more divorces in the separated group and more cases where custody of the infant was relinquished. Even at 11 to 15 months, the finding indicated that early contact mothers touched their infants more (Leiderman et al., 1973).

Facilitating reciprocal interaction between mothers and their infants in NICU

Investigations have shown that mothers (even of normal full-term infants) are amazed at the demonstration of their infants' capabilities. Curtis-Jenkins (as reported in Kennell et al, 1975) described the reaction of mothers watching him give a home examination to their infants (9 to 20 days old). The mothers were surprised at what the infants could do and expressed concern that they would feel uneasy manipulating them in the same way.

Klaus (as discussed in Kennell et al., 1975) is beginning to investigate the effects of little obvious responsiveness on the part of premature infants on the mother. Mothers are being sent into the nurseries, at least six times in the first two weeks. Half are informed that their infants see and hear and are instructed to touch and send messages to the infants and watch for responses. So far, he has found that mothers do "make contact" after a few days and become quite excited at their infant's responses.

Brazelton (as reported in Kennell et al., 1975) has been using his Neonatal Assessment Scale (Brazelton, 1973) in an attempt to lock mothers onto their premature or physically handicapped babies before discharge from the hospital. Since it is difficult to get visual responding, he encourages the use of auditory stimuli, particularly the higher pitched female voice. He attempts to elicit turning to the voice so that the mother can lock onto the baby's face. Brazelton believes that it helps mothers to be given a goal and a therapeutic role. They can then experience satisfaction from the responses they get and the progress in being able to nurture

their babies even though they are sick.

There is some evidence that this type of therapy may even have long-term effects. Barnard (as reported in Kennell et al, 1975) demonstrated the Brazelton examination to one group of mothers while the control group received the same routine care but no demonstration. At one month she asked both groups of mothers what they did when their babies cried. The routine care group responded that they gave the infants their bottles. The group which had seen their infants examined explained that they tried to see what the baby needed and how they could make him/her more comfortable.

We are now beginning to investigate the effects of an experimental intervention designed to facilitate synchronous interactions of mothers and their infants in NICU. It is our opinion that one of the most effective ways to aid a mother whose infant is in NICU is to help her realize that her baby has many individual strengths and assets and that it both desires and is able to respond to a caring parent. If she can appreciate her infant's capabilities and understand its signals, we believe she will be able to modify her behavior to the infant's, eliciting responses and meeting his or her needs. In a study we are beginning at Shands Teaching Hospital, the Brazelton Scale will be used to demonstrate to the experimental group of mothers the capabilities and individual strengths of their infants. We will call attention to the infants' responses, especially to the human face and voice. Maternal attitude of all mothers will be measured the day after birth and again at the time of their infant's discharge in order to assess change in the mothers' feelings about themselves, their infants capabilities and the NICU situation. Video-tapes of mother-infant interaction will be made at 3 weeks and

at discharge. These will be coded for synchronous interaction and attachment behaviors, e.g., mutual gazing, vocalizations, touching, etc. The number of visits and phone calls will also be recorded. Infants will be examined using the Brazelton Scale again at 3 weeks and discharge. It is expected that mothers who have the opportunity to see the examination of their own infants will feel better about themselves and their infants, will spend more time in the NICU with their infants, will engage in more attachment behaviors, and will demonstrate a more synchronous reciprocal interaction. We also expect that their infants will be more responsive in interactions and more developmentally advanced in subsequent evalustions using the Brazelton.

In summary, a great deal of evidence on the effects of early parent-infant separation has been accumulated recently. Some is suggestive, some more convincing; still, we would suggest that thoughtful and cautious interpretations be made. More systematic investigations are needed to identify the relevant variables involved in facilitating the formation of attachment and the long term effects of early intervention. Hopefully in the near future we will have adequate answers to these problems to enable us to institute major programs of intervention based on the results of these investigations. We hope that such programs of intervention will improve the developmental outcome of the infants by facilitating the establishment of an adequate parent-child attachment.

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