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Review

The development of parents-infant relationship in high-risk pregnancies and preterm birth

Camilla Pisoni[1], Francesca Garofoli[1], Ilaria Baiardini[2], Chryssoula Tzialla[1], Mauro Stronati[1]

[1]Neonatal Intensive Care Unit, Fondazione IRCCS Policlinico San Matteo, Pavia, Italy
[2]Allergy & Respiratory Diseases Clinic, IRCCS AOU San Martino-IST, Genova, Italy

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Abstract

The theory of human attachment, developed in 1951 by John Bowlby, has been widely applied across psychological, medical and social disciplines, especially in the context of developmental psychology; more recently it has been studied in the obstetric and neonatal fields. Numerous studies suggest that attachment patterns have an impact on the social, cognitive and emotional development of the off-spring, and are also believed to influence the individual's psychosocial trajectories across the lifespan.

Starting from empirical study of attachment, the psychological analysis of the experience of pregnancy allowed to introduce the concept of prenatal attachment, considered as the earlier internalized representation of the fetus that both parents acquire and elaborate during pregnancy. Recent studies have attempted to investigate how prenatal attachment develops in conditions of hazard, as for example in women hospitalized for a high-risk pregnancy or preterm birth. Literature showed that these clinical conditions may represent risk factors that, along with psychological distress and lack of familiar and social support, may adversely affect the mother-child relationship, with consequences on the psycosocial development of the off-spring.

During pregnancy, medical team should assess mothers' distress and attachment, perform procedures to positively develop attachment, and direct parents with low attachment scores to receive a professional, specific counseling. In the premature birth context, it is important to closely support mother-infant contact and to decrease maternal stress in every possible way during hospitalization and after discharge.

Promotion of psychological wellbeing and attachment during pregnancy and after birth may serve as a crucial opportunity of improving maternal health practices, perinatal health and neonatal outcomes.

Keywords

Parents-infant relationship, prenatal attachment, conditions of hazard, high-risk pregnancy, preterm birth.

Corresponding author

Camilla Pisoni, Neonatal Intensive Care Unit, Fondazione IRCCS Policlinico San Matteo, Pavia, Italy; email: pisoni.camilla@gmail.com.

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Introduction

Attachment theory was developed in 1951 by the British Psychiatrist and Psychoanalyst John Bowlby. Starting from knowledge in the fields of ethology, information processing, cybernetics, psychoanalysis and developmental psychology, he conceptualized a new theory and inspired new possibilities of thinking about the bond between a mother and her infant [1]. Attachment theory is based on the concept that the most important relationship that a child forms is within his first year of life with his primary care giver, typically, the mother. "The young child's hunger for his mother's love and presence is as great as his hunger for food" [2]. Bowlby postulated that the attachment is a system of evolutionary behaviours beginning at birth and persisting through the old age, motivated by fear, affection, exploration and caregiving.

From its first postulation, the theory of human attachment has been widely applied across psychological, medical and social disciplines, especially in the context of developmental psychology. More recently it has been studied in the obstetric and neonatal fields.

The infant's attachment system is activated as consequence of any distress period (for example, fear, hunger, discomfort, loneliness...) with the aim of achieving protection [3]. When the infant is in a recognizable situation, with no menace being perceived and the attachment figure being present, the infant is motivated to explore the environment with confidence: in this case the attachment figure is identified as a "secure base" [4]. In situation of stress and unfamiliarity, the infant experiences emotions of distress, fear or anxiety: in this case attachment behaviours (calling out, crying and clinging) are used to search for the attachment figure. Hence, the attachment theory is relevant to the protection from threat and of the necessity of survival in an evolutionary perspective [5]. Moreover, Bowlby postulated that through the attachment relationship with the caregiver, the infant develops his "internal working models" of self and others. These internal models consent the infant to predict the behaviour of others and to plan an appropriate response [6].

Depending on the established relation with the caregiver, infant could develop a secure or insecure attachment. This topic was scientifically investigated by Ainsworth and Bell (1971) in an experimental study, named "Strange Situation" [7]. The Strange Situation is a structured laboratory procedure that consists in two separations and reunions experiences between the caregiver and the infant, with the aim to determine and qualify the nature and the styles of the attachment behaviours. Observing infants reaction during the Strange Situation, three distinct patterns of attachment have been identified by Ainsworth and Bell:

- "secure attachement style": it characterizes infants that demonstrated some distress after separation from their care-giver and that were easily comforted on their return. According to Bowlby, an individual who experienced a secure attachment is likely to possess a representational model of attachment figures(s) as being available, responsive and helpful [8]. The securely attached infant seeks a bond of protection that allows him to explore the environment and the caregiver to respond in warm, stimulating and consistent way, contributing the baby to develop trust, empathy and wellbeing;
- "avoidant attachment style": it has been described in infants that did not show distress on being separated from their caregiver and that ignored the caregiver upon his return. Avoidant children represent themselves as worthless and undesirable, caused by a rejecting primary caregiver;
- "resistant/ambivalent attachment style": it has been observed in infants that were already distressed before their caregiver's departure

and did not show any comfort on their return. Ambivalent children have negative self image and overstress their emotional responses with the aim to gain attention.

Main and Solomon (1986) later reviewed a large number of infants who had initially appeared unclassifiable and proposed criteria for identifying a fourth attachment pattern [9]:

- "disorganised attachment style": it is detectable in infants that respond to the return of their caregiver with contradictory and confusing behaviours (for example freezing, appearing apprehensive, and moving in an undirected manner). Available literature data show that this attachment style is associated with an increased risk of social and emotional behavioural problems [2].

The importance of these patterns have been well investigated in numerous studies [10] suggesting that they have an impact on the social [11], cognitive [12], and emotional development [13] of the offspring. Attachment styles formed during childhood are also believed to influence the individual's psychosocial trajectories across the lifespan [14].

The extraordinarily strong influence of early experience on brain architecture in a newborn makes the first years of life a period characterized from both great vulnerability and great opportunity for the brain structure development, and for the regulation of the nervous and the stress hormone systems. Over the years the brain becomes gradually more inflexible and as such the early experiences became imprinted on the neurobiological structures. Moreover, many researchers supported that the attachment theory offers a developmental explanation of the onset of psychological disorders from childhood through to adulthood [15]. Indeed, Bowlby proposed that attachment relationships constitute the major determinants of pathology and personality organization. For example, literature data suggest that individuals with secure attachment styles are likeable, cheerful, and generally characterised by a lower probability to develop mental health difficulties or disorders. On the contrary, the presence of insecure attachment styles has been associated with an increased risk of mental health problems and disorders [2].

The attachment theory initially focused mainly on one actor of the relationship, studying the actions of the infant to the caregiver in determining the attachment [3]. More recently, attachment has been considered as an interactional process [16] in which certain attributes of the caregivers play a key role: sensitivity, acceptance, cooperation and accessibility of the caregiver have been all related to children's attachment security style [4]. Sensitive mothers are able to recognize infant's signals, to interpret infant's perceptions and to use ths information with the aim to engage in well coordinated and appropriate interactions [7]. On the contrary, non-sensitive mothers often tend to misunderstand their infant's behaviours emotions and, as consequence, they respond inappropriately to children's requests. For example, an insensitive mother may try to play with her infant when he is tired, entertains with the baby when he is hungry or feed him when he is trying to initiate a social interaction [17]. Moreover, other relevant factors that have been associated with secure attachment are proximity (ability of maintaining contact, physically and emotionally but recognizing the infant as an individual) and reciprocity (both parent and infant responding to each other's cues appropriately) [18].

The prenatal attachment

Starting from Bowlby's empirical study of attachment, the psychological analysis of the experience of pregnancy allowed to introduce the concept of prenatal attachment, considered as a process in which a pregnant woman psychic energy is emotionally invested into the fetus. The researchers hypothesized that the fetus becomes more human and loved both as an extension of self and as an independent entity to the woman, while pregnancy progresses. This early relationship received clinical evidence in mothers of infants who died during delivery: the intense mothers grief was uninfluenced by whether or not the mothers had any physical contact with the babies after delivery [19]. These findings suggest that the fetus may be considered an internalized representation of the mother and that the development of the parents-infant attachment does not start after the birth, but it already evolves during pregnancy [20].

The prenatal attachment has been described as the most basic form of the human intimacy [21], and it represents the earlier internalized representation of the fetus that both parents acquire and elaborate during pregnancy [22]. Condon suggested that antenatal attachment contained the core experience of love, and could be described as a developing relationship in which the mother seeks "to know, to be with, to avoid separation or loss, to protect, and to identify and gratify the needs of her fetus". This author later provided a formal definition of prenatal attachment as simply "the emotional tie or bond

which normally develops between the pregnant parent and her unborn infant" [23, 24].

Many researches suggested that the prenatal attachment is related to the postnatal attachment, and consecutively to the future cognitive, emotional and social development of the child [25-28]. In these studies, poor prenatal attachment resulted to be predictive of an increased probability of maternal anxiety and depression, mood disturbance and self-reported irritation with the fetus. On the contrary, a strong antenatal attachment has been associated with positive health practices during pregnancy and with good mental health during the perinatal period.

Prenatal attachment involves both future mothers and fathers. First of all, prenatal attachment is a necessary component of maternal identity and it plays an essential role in promoting a positive adaptation to motherhood: mothers with high level of prenatal attachment have a more complex internal representation of the fetus and they will be more easily predisposed to an efficient bonding.

Regarding fathers, Condon hypothesized that, complementary to maternal-fetal bonding, a paternal-fetal attachment process may be detected [24]. Mothers and fathers interact differently with the developing fetus, but evidences for these differences are still contradictory. Some studies found that mothers have higher attachment to the fetus compared with their partners [29, 30], whereas other studies have shown higher prenatal attachment in the fathers [31, 32]; a study of Wilson found similar levels of fetal attachment in mothers and fathers [33]. Further researches are needed on this topic, as the fathers' involvement can constitute an important issue in order to define and plan interventions to support parenting.

Prenatal attachment is anyhow an abstract concept, nevertheless, the abstraction of the concept has not deterred authors to develop instruments aimed to assess it. The newest and most used tools on the parental prenatal attachment have been developed by John Condon [24]; they focus exclusively on thoughts and feelings about the baby and ignore attitudes about the physical state of pregnancy or the maternal role. They are self-report questionnaires, named Maternal Antenatal Attachment Scale (MAAS) and Paternal Antenatal Attachment Scale (PAAS), that are composed by 19-item (for the mother) and 16-item (for the father) scales which consists of two dimensions: the Quality and the Preoccupation of antenatal attachment. The "Quality" dimension refers to the affective experiences the mother reported, such as closeness/distance, tenderness/irritation, pleasure in interaction, distress at fantasized loss, and conceptualization of the fetus as a "little person". The "Preoccupation" dimension describes the amount of time spent thinking about, talking to, dreaming about or palpating the fetus. On both subscales, higher scores reflect the most adaptive mother/father-fetus attachment style. This tool is widely used in the literature, and it is extremely useful in research, clinical practice and in development of interventions to support parenting before and after birth.

The prenatal attachment in high-risk pregnancies

Recent studies have attempted to investigate how prenatal attachment develops in conditions of hazard, as for example in women hospitalized for a high-risk pregnancy. This clinical condition frequently represents a crisis period for many women, with an effect on antenatal attachment. In literature, the available studies identified in pregnant hospitalized women higher level of anxiety and depression, feelings of fear, vulnerability, passivity, lower self-image and less positive expectation for their experience of childbirth [34-38]. Women experienced a profound lack of control over their bodies due to their inability to stop preterm labor and to the increased management of the pregnancy by the physician. Moreover, hospitalization disrupts family functioning and childcare too, with worry and anxiety experienced by women [34].

Feelings of anxiety or depression and a lack of an adequate family and social support would constitute an interference issue in the development of maternal antenatal attachment. Researchers confirm that higher levels of prenatal mood disorders (depression and anxiety) are related to a lower quality of the maternal/fetal rapport [39, 40]. A study of Lindgren specifically investigated the relationship among maternal antenatal attachment, presence of prenatal depression and health practices in pregnancy [41]. The author found that women with lower depression scores had higher levels of prenatal attachment with a significant, positive direct effect on personal involvement in health practices. These studies highlight the association between psychological wellbeing/distress and levels of prenatal attachment and encourage actions to proper psychological support the mother during pregnancy.

Regarding future fathers, to be partners of a high-risk pregnant woman may represent an experience

of situational crisis. In other words, the presence of critical clinical problems, in addition to the usual emotional reaction to pregnancy, may affect father's mood and, as a consequence, the prenatal and postpartum attachment. Moreover, the role of the partner is often to support his wife and to manage the family at home, with a great deal of physical and psychological energy. A recent study showed that the level of paternal antenatal attachment of low-risk pregnant women are higher than those of high-risk pregnant women [30]. Unlike this study, Mercer and co-workers found no significant differences in the paternal antenatal attachment of low-risk and high-risk pregnant women [42]. Further studies are needed to better understand this issue and to ensure the couple's harmony even in critical contexts.

The parents-infant attachment in preterm birth

Preterm birth represents a complex event for families due to several reasons. The period between 24-32 gestational weeks is crucial for the development of a maternal representation of the fetus [43]. During this period, the mother is deeply involved with her expecting infant: she identifies the infant's needs and imagines their relationship [4, 43]. During the last trimester of the pregnancy, the representations of the idealized infant gradually shift toward the real infant, and this phase prepares the mother for the birth and for the separation from the infant [44]. Preterm delivery suddenly interrupts the development of maternal and paternal representations, and therefore could make more difficult the establishment of a correct parents-infant relationship.

Having a premature infant may increase the parents' feeling of incompetence and insecurity. Then, the stressful and traumatic aspect of preterm birth and its psychological impact on parents could negatively interfere with the process of attachment. Parents spend most of their time in the hospital with their ill infant and often they do not even know whether their infant will survive. This situation can be so difficult, frightening and overwhelming that parents could keep an emotional distance from their infant [45-47]. The interrupted representation process, a traumatic birth experience, an early separation and a fear for infant's health and survival may complicate the parents' attachment process [43].

Moreover, the infant's discharge from the neonatal intensive care unit (NICU) is at the same moment a joyous homecoming and a stressful transition for families. As matter of fact, the parents have to assume care for an infant who requires ongoing specialized interventions, and who remains immature and at risk for hospital readmission.

However, in the past decades more attention has been directed to the support and to the guidance for parents with an infant admitted to a NICU. Presently, mothers and fathers are encouraged and supported by the hospital staff to take on an active role in the daily care for their preterm infant (as much as possible). Mothers and fathers can for instance practice infant handling and Kangaroo Care (skin-to-skin contact). These changes have the purpose of contributing to an adequate relation of attachment [48].

Long-term studies are relevant to prenatal and postnatal observation of maternal behaviours. Mothers bearing high risk fetuses showed qualitative deficits and distortions in maternal representations of preterm newborn. Higher prevalence of unrealistic fears for the infant's safety and more overprotective parenting style have been described [49, 50]. This type of maternal representations may develop into a problematic parenting style in which the parent presents difficulties in recognizing the infant's strengths and needs for independence and threaten the child's later socio-emotional development.

Conclusion

The birth of a child represents a positive experience for many parents. However, some mothers and fathers, due to their psychological characteristics or as a consequence of clinical problems (for example high-risk pregnancies or preterm birth), can experience specific difficulties. A decline in the quality of the couple relationship, the presence of physical exhaustion, an increased psychological distress, and difficulties with developing effective parenting behaviours have been described. The detection of these problems constitutes the first, essential step in order to plan specific interventions.

Literature showed that high-risk pregnancies and premature births may represent hazard factors that, along with psychological distress and lack of familiar and social support, may adversely affect the development of an adequate mother-child relationship.

In order to attempt promotion of a secure attachment style, in case of maternal hospitalization during high-risk pregnancy, it is essential to early identify parents with non adequate attachment representations. When interventions are offered,

first the focus must be on the underlying reasons which may have caused parental inadequate internalization of the fetus. Subsequently, when this process is completed, attention needs to be directed to change the attachment representations, in order to create an harmonious relationship between parents and expected infant.

In the premature birth context, it is important to closely support mother-infant contact and to decrease maternal stress in every possible way during hospitalization and after discharge. Identifying parents who experienced a trauma related to the premature birth of their child would help to plan supportive interventions in the neonatal period, with the objective of helping the parents to cope with a possible ongoing traumatic situation. In addition, it is essential to recognize, beside parental posttraumatic stress, the importance of the infant's characteristics as a factor in the construction of each unique parent-infant relationship. Providing opportunity to parents for handling, caring for and observing their preterm infant during hospitalization increases parental feelings of self confidence. Promotion of prenatal psychological wellbeing and attachment may serve as a crucial opportunity of improving maternal health practices, perinatal health and neonatal outcomes. During the prenatal period, medical team should assess mothers' distress and prenatal attachment, perform procedures to positively develop attachment, and direct pregnant woman with low attachment scores to receive a professional, specific counseling. Further researches should focus on screening instrument to identify parents with attachment problems and on planning adequate intervention for both mothers and fathers. A multidisciplinary team, composed by gynecologist, neonatologists, psychiatrist, psychologist, nurses and midwives, should cooperate in order to early identify the spectrum of affective disorders across the perinatal period. This type of prevention is a great chance to reduce the effects of prenatal and consequently postnatal disorders of the parent-infant relationship.

Declaration of interest

The Authors declare that there is no conflict of interest.

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