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Effects of an intervention program on maternal and paternal parenting stress after preterm birth: A randomized trial

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ABSTRACT

Background: Preterm birth causes parenting stress and increases the risk of developmental disorders in children. Our objective was to assess the impact of an early psychological intervention, Triadic parent-infant Relationship Therapy (TRT), on parenting stress, parental mental health and preterm infant development in the motor, language, social, behavioral and emotional domains at a corrected age of 18 months.

Methods: Sixty-five families of preterm infants were randomly assigned to the intervention group ($n = 33$) or the control group ($n = 32$). Families of full-term children ($n = 24$) were also recruited. Intervention focused on the triadic relationship and aimed to improve parenting stress by supporting parental mental health to promote infant development. The main outcome was assessed with the Parenting Stress Index Short Form (PSI-SF).

Results: Highly significant differences at 18 months were observed for the mother and father in overall PSI-SF scores, with 16.6, and 11.7 points, respectively, in favor of the intervention group. Children in the intervention group demonstrated higher full-scale developmental quotients than the preterm controls (an 8.7-point difference) along with lower scores on behavioral tests (a 5.8-point difference at 18 months). At 18 months, results for children in the intervention group showed no significant differences compared to the full-term group or were even better.

Conclusions: Our study provides sound evidence for the efficiency of the TRT program to reduce parenting stress and improve parental mental health for both parents, thus fostering the infant's overall development.

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1. Introduction

Preterm infants are at increased risk for the development of motor, cognitive, behavioral, and emotional problems [1–3] that may persist into adolescence and even adulthood [4,5]. Many factors influence these developmental difficulties and child-related causes have been well-documented. However, some studies provide evidence of the potential effect of the child's environment on the plasticity of the developing brain, which is highest in infancy [6–8]. Environmental factors related to parental mental health appear to be particularly relevant for preterm infants as it was shown that prematurity increases the level of parenting stress, the prevalence of depressive symptoms [9–11] and post-traumatic stress disorder [11,12]. In particular, parenting stress is an important factor to focus on, as it is associated with parental mental health difficulties [13] and with changes in caregiving quality such as increased maternal intrusiveness [14], reduced maternal sensitivity [15] and increased attachment insecurity for the child [16]. This stress hinders behavioral and emotional regulation abilities on the child [10,17], which can result in behavioral and socio-emotional disorders later in his life [18,19].

Several early intervention programs using various approaches have been proposed in recent years with the aim of improving parental mental health and, subsequently, the development of the child. A recent meta-analysis [20] reported seven randomized controlled trials in which parenting stress was evaluated [21–28]. The overall effect of the

Abbreviations: TRT, Triadic parent-infant Relationship Therapy; PSI-SF, Parenting Stress Index Short Form; EPDS, Edinburgh Postnatal Depression Scale; PTSD, perinatal post-traumatic stress disorder; NBAS, Neonatal Behavioral Assessment Scale; DQ, developmental quotient.

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interventions on stress, pooled over the seven studies, was not significant but a significant decrease in stress was observed in the two studies where the intervention program combined parent education and parent support, with active involvement of the parents [23,24,26]. Parenting education alone did not reduce stress.

A drawback of most intervention programs to date, as pointed out by Benzies et al. [20] and Spittle et al. [29], is that they have primarily addressed mothers. To our knowledge, two studies only evaluated the fathers but fathers were not included in the therapeutic approaches [22–24]. However, several studies recently demonstrated that paternal parenting stress and mental health were associated with increased behavioral and socio-emotional problems in preterm children [10,30]. Studies in general populations have also reported that the impact of one parent's psychological distress on the other parent increases the entire family's psychological disturbances [31–33], leading to the need for joint interventions for both the mother and father [34,35]. Knowing that fathers and mothers of preterm children continue to report significant mental health disorders two years after the birth [17], an intervention extending beyond the first year postpartum appears relevant, as suggested by Spencer-Smith et al. [36].

We developed an intervention program called Triadic parent-infant Relationship Therapy (TRT) that aims to improve parent-infant relationship over the child's first 18 months, by providing joint psychological care to both parents and by promoting the infant's development. The main objective of this open, prospective, controlled and randomized trial was to evaluate the effect of this intervention program on mother and father parenting stress. Secondary objectives were to evaluate the effect of the intervention program on parental psychological health and infant development, and to assess whether the same endpoints observed at 18 months in the intervention group are close to the values observed in families with full-term infants.

2. Methods

2.1. Ethics statement

This study received approval from the relevant ethical committee (CPP: n 2005–36; DGS: 2006/0215), and all parents provided informed consent.

2.2. Participants

Eighty-nine families were included in this study, 65 families with preterm infants and 24 families with full-term infants. The families with preterm infants were recruited over 27 months from the Neonatology Department of the University Hospital of Caen. As inclusion criteria, the parents were required to be French speakers, over 18 years old, without known psychiatric history and residing within a 50-km radius of the hospital. Enrolled children were required to be between 28 and 35 weeks gestational age + 6 days with no congenital anomalies or any other foreseeable disabilities during the neonatal period. Siblings were not excluded from the study.

At 12 months corrected age of each preterm infant we recruited from maternity birth register a family whose child was born at term 12 months earlier. Twenty-four families agreed to participate. An assessment was only at 18 months.

2.3. Randomization and masking

Each family with preterm infants was assigned to a group (TRT vs. control group) using a blocked-randomization list (blocks of 4). Thirty-three families were assigned to the intervention group, 32 families to the control group. Randomization was made after the inform consent was signed, by a member of the medical staff. He was not involved in the patients' inclusion and was the only one to have access to the list. The study was open. However, one clinical psychologist provided TRT counseling to the intervention group while another, who was in charge of family evaluations, was blinded to the group at the first assessment.

2.4. Intervention

Both the intervention and control groups received routine follow-up medical care with monthly visits to a practitioner for the first six months and then every three months. The TRT psychological intervention program, delivered to the families of the intervention group, focused specifically on triadic attachment. It consisted of 22 sessions, including home visits twice per month during the first four months followed by monthly consultations in the neonatology ward, up to a corrected age of 18 months.

We based our psychological intervention on attachment theory [37]. Each session was adapted according to the evolution of the parent-child attachment process as well as the child's development stages. Therapeutic interventions were organized in three stages:

1. Facilitate the father-infant and mother-infant interactions to enhance emotional sharing within the triad mother-father-child and mental health for both parents.
2. Promote understanding of infant development to reduce parental stress and strengthen parents' appropriate perceptions regarding their infant's behavior.
3. Promote parents-infant triadic relationships to foster infant's cognitive, motor, socio-emotional and behavioral development (see annex for Manual).

The first objective of the intervention was to alleviate parenting stress and to boost parents' confidence in the prospects for their child's development. The second objective was to promote parental sensitivity by supporting the parents in verbalizing their emotions and increasing their confidence in taking care of their infant based on their own experiences and sensitivities.

2.5. Outcomes

Assessment of the intervention and control groups took place over four evaluations: at discharge and at the corrected ages of 3, 9 and 18 months. Full-term children were assessed with their parents at 18 months of age. Experimental plan appears in Fig. 1.

During the observations, any evidence of worrisome neuromotor symptoms resulted in a referral to an infant consultation center. Similarly, parents who exhibited great distress were referred to a specialized psychological care ward.

2.5.1. Mother and father parenting stress

The Parenting Stress Index Short Form (PSI-SF), a widely used self-report questionnaire, was used to assess stress in the parent–child system [38]. The PSI-SF contains 36 items and yields a Total Stress score indicative of the overall level of parenting stress in addition to three subscales: Parental Distress, Parent-Child Dysfunctional Interaction and Difficult Child. The PSI-SF Total Score constituted the study's primary assessment criterion.

2.5.2. Parental psychological health

Depression and post-traumatic stress disorders were assessed. The Edinburgh Postnatal Depression Scale (EPDS) was used to assess maternal and paternal depression [39]. The cut-off we used for mother depression was >11 [40] and for father depression >9 [41]. For post-traumatic stress disorders, we used the Perinatal Post-Traumatic Stress Disorder (PTSD) Scale which is a self-report questionnaire especially designed for parents of high-risk infants [42].

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