ENCYCLOPEDIA on Early Childhood Development

Behavioural and Emotional Functioning in Preterm Infants

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Introduction

It has now been well documented that premature infants are at significant risk for neurodevelopmental disabilities.[1,2] Studies in this area have typically focused on the motor and cognitive sequelae of prematurity, paying less attention to temperament, behaviour, and emotional disturbances. Recent data suggest that premature infants are also vulnerable to abnormalities in behavioural and social development, which may be the precursors of subsequent learning disabilities and psychiatric disorders which occur during mid-childhood.[3,4]

Subject

Recent improvements in neonatal intensive care have led to an increased number of survivors among infants with very low birthweight (VLBW, <1 500 g) and extremely low birthweight (ELBW, <1 000 g).[2] These infants are at greater risk for behavioural and emotional problems. Our review focuses on problems from birth until preschool age, in infants born at less than 34 weeks of gestational age.

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Problems

During the 1990s, several studies were conducted regarding behavioural and emotional functions in preterm infants. However, methodological flaws in study designs precluded any firm conclusions regarding these functions. Flaws included the use of clinical rather than population-based samples, a broad range of gestational ages in relation to the birthweights of subjects, small sample size, lack of psychometrically sound assessment tools, lack of controls, and failure to provide information on medical and psychosocial risk factors.[5,6,7]

In addition, research findings could be deemed inconsistent based on the fact that multiple respondents reported on child behaviour from different contexts. The majority of studies related to infant temperament and behaviour have been obtained through maternal ratings. But maternal ratings of temperament have been viewed as reflecting the characteristics of the mother, rather than the infant.[6] Several investigators have reported a substantive association between maternal mental health and behaviour in children.[7-10] Maternal reports of behavioural problems and social competence often differ from those of teachers, who tend to relativise children's behaviour in relation to that of their peers.[11] Similarly, there is often discordance between maternal and clinical ratings. Assessment by clinicians may not reflect a child's usual disposition.

Research Context

Infants who are <1 500 g are more likely to experience significant medical complications, such as severe respiratory distress, haemorrhages in the brain, and poorer nutrition, all of which may have long-lasting effects on the central nervous system. These biological effects are compounded by social risk factors, which are more prevalent among families of infants who are born prematurely.[12] Further, premature infants may be hospitalized for prolonged periods, resulting in extended separation from parents, increased anxiety, and possible interference with parent–infant attachment. Therefore, it is not surprising that behavioural and emotional sequelae are more prevalent among preterm infants.

Key Research Questions

Further initiatives regarding premature infants are required in the following areas:

1. Reviews of evidence supporting increased behaviour and social problems among VLBW and ELBW infants during infancy and preschool years.

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2. Examinations of how biological and social factors contribute to the development of behavioural problems.

Recent Research Results

Infant Temperament

Infant temperament is a highly relevant factor in development, as early difficulties may predispose preterm children to subsequent behavioural maladjustments,[13] and affect the quality of their relationships with caregivers.[6] Based on standardized parent report measures, preterm infants and children have typically been found to demonstrate less adaptability, rhythmicity, activity, attention, and persistence than do full-term infants.[14-16] Premature infants have also been found to be more intense in their moods, more difficult to soothe, more passive, and less socially responsive.[17] As toddlers, preterm infants have been found to be arrhythmic, less persistent and adaptable, and more susceptible to negativity.[18] At preschool and early school ages, some tendencies towards increased activity and intensity, and lack of persistence remain.[18] Literature in the field indicates that premature infants may initially be more challenging to parents. Changes in temperament over time may be influenced by both biological and environmental factors.[16,18]

However, although premature infants as a group are at greater risk for developing problems with temperament, these problems only occur in a minority of infants. Only those studies that have limited their sample to VLBW infants and infants with significant medical complications are associated with differences in temperament. Prematurity per se does not appear to be a risk factor for abnormalities in temperament.

Behavioural Functioning

Although some studies report negligible findings, overall, the literature suggests that premature infants are particularly vulnerable to behavioural adjustments and emotional problems.

Findings have been much more consistent when the prevalence of ADHD is considered. Marlow et al.[19] reported that at 5 to 6 years or age, both parents and teachers found the children to be more overactive and fidgety than controls. In a study by Szatmari et al.,[20] a higher incidence of ADHD was found in parent reports at age 5, but no significant difference was noted in teacher reports. Other studies on VLBW populations have also found a higher frequency of inattention,

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hyperactivity, or have diagnosed ADHD by school age.[4,21,22] ADHD appears to be more common among premature infants who exhibit neurodevelopment problems[20] and those with lower birthweights and gestational ages.[4] There seems to be some indication that males are at increased risk, and that adverse social conditions may exacerbate these behaviours.[6] Premature children do not appear to be at risk for conduct problems, as long as adverse environmental conditions are controlled.

Emotional Disturbance

Several studies have found a higher level of anxiety, depression, and emotional dysfunction in children born prematurely.[5,22,23] However, other studies failed to find a similar associations.[4,24,25] These contradictory findings may be attributable to wide-ranging gestational ages among subjects, differences in socio-economic status, and varying parenting characteristics.

Social Competence and Adaptive Functioning

Premature children tend not to initiate social behaviours,[26] show less pleasure in interacting with their mothers, and are less responsive to social interactions.[27] To some extent, problems with social abilities are a function of lower intellectual levels in VLBW infants.[28] When heavier birthweight infants are included, these problems are less obvious. Children born prematurely appear to be at risk for poorly developed adaptive skills, which become more apparent later in life.[29,30,31]

Contribution of Biological and Social Factors

Most studies demonstrate that behavioural problems are associated with adverse environmental conditions, such as lower socio-economic status, maternal depression, and family stress. The impact of these negative factors may be greater in VLBW than in normal birthweight children. A nurturing home environment fosters development of self-regulatory behaviours.[32] Multiple regression analyses indicate that temperament, environment, and the interactions between development and the quality of the home environment predict attention problems in childhood.[33] Temperament and behaviours were related to gestational age and cognition, showing weak correlations with periventricular leukomalacia, intraventricular haemorrhage, and cerebral palsy.[17,33]

Conclusions

As a group, infants and young children born prematurely are described as being more withdrawn, less adaptable, less persistent, and less temperamentally stable in their infancy compared to full-term infants.[34] These characteristics are more prevalent in infants who are VLBW, and those with medical complications. Children born prematurely also have difficulties in global behaviours, particularly with regard to the prevalence of ADHD, but they do not appear to be at risk for developing conduct disorders. Problems with social competence and adaptive functioning are also more common in these infants than in their full-term peers. Again, these characteristics appear to be restricted to infants under a 1 500 g birthweight, those with neurological and intellectual problems, and those living in adverse environmental and social circumstances. Infants with <750 g birthweights are at greatest risk for developing attentional problems.[35] Recent reports suggest that very premature infants born in the 1990s continue to have behavioural difficulties and attentional problems[36] that persist to school age.[37]

Implications

Given the higher survival rates among preterm infants, the cumulative toll on the health care system related to behavioural and emotional difficulties will likely grow. In designing effective interventions, it is therefore important to understand the relative contribution of underlying biological and social factors. Further investigation is required to determine whether lending support to parents can alter parental behaviours and improve the quality of mother–infant attachments and infant responsivity. Meanwhile, it is important to inform parents of ELBW infants of the increased likelihood of behavioural problems, so that they are better prepared to cope and seek appropriate remediation. To this end, health care professionals should focus on early diagnosis and treatment.

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