Prematurity and Its Impact on Psychosocial and Emotional Development in Children

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Topic
Prematurity

Introduction
A premature birth is a birth that occurs before the 37th week of pregnancy. High-risk premature births occur at 32 weeks of gestation or earlier, at weights under 1 500 g. Very-low-birthweight (VLBW, <1 500 g) infants, who make up about 10% of live deliveries in Canada, may require treatment in Neonatal Intensive Care (NICU) for up to three months.

Subject
While mortality rates for VLBW infants have declined, there has been increasing concern about their long-term morbidity rates. A small proportion (10% to 20%) of VLBW infants are born with severe neurodevelopmental handicaps such as blindness, cerebral palsy, or IQ in the mentally deficient range, and a larger number show more subtle deficits, including learning disabilities and behavioural problems. Indeed, VLBW children have been found to exhibit a variety of behavioural problems, such as attention deficit disorder, hyperactivity, excessive shyness and withdrawal, and social problems.[1-3] One study found that at age 6, 22% of low birthweight children had at least one psychiatric disorder, with attention deficit disorder and anxious disorders being the most common.[4] In fact, VLBW children run more than twice the risk of developing attention deficit hyperactivity disorder.

Problems
VLBW infants are medically fragile, and may suffer from many complications, including respiratory distress syndrome, intraventricular haemorrhage (bleeding in the brain), and retinopathy of prematurity (abnormal growth of blood vessels in the eye). They often continue to experience physical health problems that may require frequent medical visits and re-hospitalization in the early years of life. This may limit their participation in regular childhood activities, which may in turn affect their development of social skills. These infants can also be challenging interaction partners for their parents, due to their fragility, irritability, and lack of responsiveness to their social environment. Many parents feel emotional distress following the birth of a VLBW infant, and this may affect

parenting behaviour. Maternal anxiety, assessed while the infant was hospitalized in the NICU, has been associated with less effective parenting behaviour in early infancy and in toddlerhood.[5] Continuing parental worries that the prematurely born infant is at risk for medical and developmental problems may reflect the "vulnerable child syndrome."[6] This syndrome may be associated with less effective parental behaviour, such as overprotectiveness, maternal separation anxiety, and failure to set limits, as well as child behaviour problems, such as social withdrawal, somatic complaints, and aggressive and destructive conduct.

Research Context

Developmental outcomes in VLBW infants are best understood as an interaction between biological vulnerability and environmental factors, such as socio-economic status and parental attitudes, and behaviour. Preterm infants may be particularly susceptible to environmental influences in that the impact of environmental factors on infant behaviour is often stronger in preterm infants than it is in full-term infants. Therefore, to assess risk for abnormal outcomes in VLBW infants, it is essential to consider both medical and psychosocial risk factors.

There are still many challenges facing researchers studying developmental outcomes in VLBW infants. Indeed, continuing advances in medical technology have brought about the survival of smaller, sicker babies, making it difficult to compare children from different periods of time. Furthermore, studies demonstrating differences between VLBW and normal birthweight children have shed little light on the processes that lead to such discrepancies.

Key Research Questions

We have identified three main strands for further research:

1) The impact of premature birth on the developing brain
2) The factors that promote or impede the development of satisfactory parent–child relationships
3) Early intervention with parents and their VLBW infants.

Recent Research Results

Magnetic resonance imaging studies have shown reduced brain volume in children who were born preterm as compared to children born at full-term;[7] smaller brain volumes were associated with lower cognitive scores and a higher incidence of attention deficit disorder. On the basis of animal models, Bhutta and Anand[8] suggest that neonatal complications in VLBW infants (such as a lack of oxygen to the brain and sepsis) may result in neuronal death, which can, in turn, affect behavioural development. Neurological soft signs are associated with internalizing symptoms, including anxiety, depression, and withdrawal in children born preterm.[9] Maternal responsiveness (which includes awareness of and sensitivity to an infant's cues) is associated with greater social and intellectual competence among VLBW children in early childhood.[10] By contrast, controlling, restrictive parental behaviour is associated with poorer social skills and cognitive development among VLBW children at age 3.[11] Recent research has also indicated that factors such as maternal distress and a lack of social support affect mothers

in their ability to parent in a sensitive and responsive fashion,[1] and thus may mediate the relationship between maternal distress and social and emotional problems in VLBW children.[12,13]

Interventions with premature infants and their parents have ranged from targeting a specific risk factor (such as the need for supplementary sensory stimulation) to offering a comprehensive package of services (including medical follow-up, parent training, and centre-based care for infants).[14] Recent efforts have focussed on promoting maternal competence and enhancing the mother–infant relationship. For example, Kangaroo Care, that encourages mother–infant skin-to-skin contact, has been found to increase parental sensitivity and reduce intrusiveness.[15] Therapeutic interventions designed to reduce maternal distress have shown some benefits[16], but have not been tested in randomized controlled trials.

Conclusions

Because VLBW children are at greater risk than their full-term counterparts for both learning and behavioural difficulties, it is important to investigate how both psychosocial and biological risk factors may affect child outcomes. Sophisticated imaging techniques can be used to learn more about the impact of prematurity on brain development and the ensuing medical procedures that infants must undergo in the NICUs. The lengthy hospital stays required by most VLBW infants and the separation from their parents that ensues can provoke anxiety in parents about their child's health and uncertainty regarding their ability to parent their fragile infant. The development of self-regulation in VLBW infants may be delayed or impaired due to the fact that they are difficult interaction partners. Their responses to social stimulation and their behavioural signals are weaker than those seen in full-term infants. Consequently, caregivers may have greater difficulty behaving responsively with their VLBW infants. While VLBW infants may be challenging and somewhat unsatisfying interaction partners, sensitive parental behaviour can produce significant benefits.

Implications for Policy and Services

Children born preterm who exhibit cognitive deficits and behaviour problems tax the physical, emotional, and financial resources of their families. Moreover, these children may enter school lacking adequate cognitive and social skills and thereby place a great burden on educational and social services. Therefore, in order to plan appropriate interventions for VLBW children, it is necessary to screen early, and specify the determinants of their future social and academic competence. By identifying factors that are associated with poor developmental outcomes (such as parental anxiety or lack of social support) it may be possible to sensitize health and education professionals to circumstances that may facilitate or impede parents' ability to provide sensitive, responsive care to VLBW infants. Preventive interventions that begin in early infancy and that target parental well-being as well as the improvement of parenting skills are likely to be the most useful approaches to ensuring optimal developmental outcomes in the future.

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