Traumatic Brain Injury

Childhood traumatic brain injury and long-term psychosocial outcomes.

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Childhood traumatic brain injury is one of the most common causes of mortality and impairments in children and adolescents impacting on the development of neuropsychological, social and psychological functioning. A disruption of development in these areas often results in long-term problems with interpersonal relationships, participation in leisure and social activities, and employment status (Anderson, Brown et al. 2009; Muscara, Catroppa et al. 2009) which may compromise psychosocial functioning, quality of life and wellbeing.

Evidence from the social sciences confirms that disruptions to social development can cause social impairment and social maladjustment, increasing the risk of poorer quality of life and psychological disorder. Social skills are intimately linked with neurological and cognitive functions (Adolphs, 2001). For example, to be socially competent, an individual needs to be able to attend to other, inhibit inappropriate behaviour (executive functions), communicate effectively (language skills), and interpret other's meanings (social cognition). Adult studies indicate that these specific skills and intentions can be linked to specific brain regions (e.g., theory of mind and response inhibition to prefrontal cortices) (Adolphs, 2001), the end product, the social functions we observe in daily behaviour, are most likely represented by an integrative neural network. Brain regions commonly included in this social network include the prefrontal cortex and temporoparietal junction, insula, and amygdala (Adolphs, 2001). As has been demonstrated for cognitive functions, it is likely that this network develops and becomes refined throughout childhood and adolescence (Beauchamp & Anderson 2010). An injury to the brain, particularly during the formative childhood years, has the potential to disrupt this network and result in social dysfunction (Yeates et al., 2007).

Yeates and colleagues (2007) present a heuristic model describing social outcomes within a developmental psychology framework and it focuses on ways in which a TBI in childhood can influence social function. Three important components of social function are highlighted; social information processing, social interaction, and social adjustment. These components influence the way a child processes and attributes social cues, and will therefore affect their reaction and adjustment in social interactions. Children with impaired social information processing and poor self-perception show more aggressive, anxious and withdrawn responses in peer interaction (Parker et al., 2006; Rubin, Bukowski, & Parker, 2006), which may lead to peer rejection and isolation. This model describes psychosocial outcomes as susceptible to brain insult-related risk factors, such as type of insult, severity of insult and brain abnormalities, as well as non-insult factors such as parenting style, family function and socioeconomic status.

Despite reports that psychosocial problems represent the most debilitating of all consequences following CTBI (Anderson et al., 2010), the majority of research investigating the consequences of CTBI has focused on cognitive outcomes. Recently though, and in keeping with the emergence of social neuroscience, research has begun to address social and

psychological outcomes. The studies available that have investigated the psychosocial outcomes of TBI have reported that poor social function following childhood TBI leads to persisting social maladjustment, psychological problems and reduced quality of life (Anderson et al., 2010; Cattelani et al., 1998).

Max and colleagues investigated different aspects of psychological function after CTBI, using questionnaires and rating scales (CBCL and The Schedule for Affective Disorders and Schizophrenia for School-Age Children). They demonstrated that children and adolescents who survived CTBI, and their parents, report more internalizing symptoms than externalizing symptoms. Teachers on the other hand report more externalizing symptoms. Further children with TBI were more at risk developing a novel psychiatric disorder (novel anxiety disorder - 8.5%; novel subclinical anxiety disorders 17%). Asarnow, Satz, Light, Lewis and Neumann (1991) also report that children with mild and severe brain injuries exhibit more internalizing and externalizing behaviour on the CBCL than their same age peers. However, few studies have examined more specific psychosocial symptomatology, e.g. depression, anxiety, withdrawal, aggression and substance abuse there is limited research in a child and adolescent population.

A handful of studies have retrospectively looked at long term psychosocial functioning in adulthood after CTBI as part of a broad survey of sequelae. Interestingly, these studies have shown that psychosocial problems appear to persist longer than other functional consequences, and have a significant impact on quality of life and participation. For example, Anderson et al. (2009; 2010) reported that children with CTBI, especially survivors of severe TBI, are more vulnerable to develop psychosocial problems that required intervention and were more commonly linked with poor quality of life. Similarly, Cattelani and colleagues (1998) found that adults with severe TBI during childhood had more psychological problems and poorer quality of life than adults without a TBI; 5-14 years post injury. More recently Rosema et al., (in sub) found in a prospective study that young adults who suffered a CTBI, report more depressive, anxious and withdrawn symptoms than the normally developing control group. Although the research out there shows impairments, it is not quite clear yet what factors impact psychosocial outcomes and the neural development long term.

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