Official Journal of the European Paediatric Neurology Society

Original article

Behavioural problems in school age children with cerebral palsy

Marie Brossard-Racine [a], *Nick Hall* [f], *Annette Majnemer* [a,b,c,*], *Michael I. Shevell* [a,b,c], *Mary Law* [d], *Chantal Poulin* [b,c], *Peter Rosenbaum* [e]

[a] *School of Physical & Occupational Therapy McGill University Health Centre, QC, Canada*
[b] *Departments of Neurology & Neurosurgery, McGill University Health Centre, QC, Canada*
[c] *Pediatrics, McGill University Health Centre, QC, Canada*
[d] *School of Rehabilitation Science, McMaster University, ON, Canada*
[e] *Department of Pediatrics, McMaster University, ON, Canada*
[f] *Department of Internal Medicine/Neurology, University of Manitoba, MB, Canada*

ARTICLE INFO

Article history:
Received 15 March 2011
Received in revised form
20 September 2011
Accepted 3 October 2011

Keywords:
Cerebral palsy
Strengths and difficulties questionnaire
Behavioural difficulties
Parental stress

ABSTRACT

Background: Although behavioural problems are frequent in children with Cerebral Palsy (CP), the exact nature of these difficulties and their relationship with intrinsic or extrinsic factors are just beginning to be explored.

Aim: To describe and characterize behavioural problems in children with CP and to determine the nature of any relationships with child and family characteristics.

Methods: In this cross-sectional study, children with CP between 6 and 12 years of age were recruited. Children were assessed using the Leiter Intelligence Test, the Gross Motor Function Measure, the Strengths and Difficulties Questionnaire (SDQ), the Vineland Adaptive Behavior Scales and questionnaires on demographic factors. Parents' level of stress was measured with the Parenting Stress Index.

Results: Seventy-six parents completed the SDQ. Using the Total Difficulties Scores, 39.4% of the sample scored in the borderline to clinically abnormal range. Peer problems were the most common (55.3%). High parental stress was consistently associated with behavioural difficulties across all domains of the SDQ. Not surprisingly, better socialization skills and a lower parental stress were correlated with more positive behaviours.

Conclusion: Behavioural difficulties are common in children with CP and appear not to be associated with socio-demographic variables and physical and cognitive characteristics. These difficulties are an important correlate of parental distress. This study emphasizes the need to recognize and address behavioural difficulties that may arise so as to optimize the health and well-being of children with CP and their families.

* *Corresponding author*. Montreal Children's Hospital, Division of Pediatric Neurology, 2300 Tupper, Room A-509, Montreal, Quebec H3H 1P3, Canada. Tel.: +514 412 4400x22902; fax: +514 412 4373.
E-mail address: annette.majnemer@mcgill.ca (A. Majnemer).

1090-3798/$ – see front matter © 2011 European Paediatric Neurology Society. Published by Elsevier Ltd. All rights reserved.
doi:10.1016/j.ejpn.2011.10.001

1. Introduction

Cerebral palsy (CP) has most recently been defined by Rosenbaum and colleagues as: " a group of permanent disorders of the development of movements and posture, causing activity limitations that are attributed to non progressive disturbances that occurred in the developing fetal or infant brain".[1, p.8] It is the most common cause of significant motor impairment in children[2] with a prevalence of 2.0–2.5/1000 live births.[3–5] These motor deficits – together with cognitive, speech, behavioural and sensory impairments – are collectively associated with limitations in activities of daily living, and restrictions in participation in leisure, social and other preferred activities.[6]

Behavioural difficulties in children with developmental disabilities can affect family functioning and overall well-being of the child and family members.[7,8] It is also known that a higher level of behavioural difficulties in children is associated with greater parental stress in different populations.[9–11] Few studies have described behaviour problems in children with CP. Preliminary studies suggest that behavioural and/or emotional disturbances are highly prevalent in this population of interest, ranging widely from 26 to 80% across studies which have employed different psychometric tests and methodologies of ascertainment.[12–16] Even though frequent, the precise nature of these behavioural disturbances, and their relationship with intrinsic or extrinsic factors, are just beginning to be explored. Common problems reported in studies to date include: difficulties with peers, attention problems, hyperactive behaviour, emotional problems, increased dependence, withdrawal, obstinacy and antisocial characteristics.[7,14–17] Intrinsic factors that have been shown to correlate with an increased likelihood of behavioural problems in children with CP include presence of epilepsy, limited or no walking abilities,[7] hearing loss, intellectual impairment[15,16]and pain.[15]The SPARCLE study in Europe also identified that being an only child, having sibling(s) with a disability, residing in a small town, or attending a special school program were important extrinsic factors associated with greater risk for behavioural problems.[15] These studies have identified several child-related and environmental factors associated with behavioural difficulties, but possible and potentially modifiable relationships with other factors – such as parental stress and activity limitations – remain to be determined in children with CP. Evidence is needed to more precisely estimate the prevalence of behavioural difficulties in children with CP, as this is currently underappreciated clinically as an important and common comorbidity that requires intervention and attention. Furthermore, child and family variables that appear to be associated with a greater likelihood of behavioural problems[15,16] require validation in other samples. The aim of this study was twofold: 1) to characterize behavioural problems in school-age children with CP and 2) to identify any modifiable factors associated with problematic behaviour. Specifically, we hypothesized that behavioural difficulties would be associated with higher levels of parental stress and with activity limitations.

2. Subject and methods

2.1. *Procedures*

As part of a broader study investigating determinants of leisure participation and life quality in school-aged children with cerebral palsy[8,18] a representative sample of school-aged children (6–12 years of age) diagnosed in early childhood with cerebral palsy by a paediatric neurologist was recruited. As per the definition of cerebral palsy, children diagnosed with disorders of non-cerebral origin (eg. neural tube defects, neuromuscular disorders) or progressive disorders (neurodegenerative, neoplastic, metabolic processes) were excluded.[19] Families who did not speak and or read either English or French were not enrolled. Behavioural difficulties were theorized as possible determinants of quality of life and were measured as possible dependent variables. Once parental consent was obtained, an appointment was made to conduct all evaluations at the Montreal Children's Hospital. All children were examined by a neurologist to confirm a diagnosis of cerebral palsy. An occupational therapist administered the Vineland Adaptive Behaviour Scales (VABS)[20] by semi-structured interview with a parent or caregiver, and performed the Gross Motor Function Measure (GMFM-66).[21] Motor function was subsequently classified using the Gross Motor Function Classification System (GMFCS).[22] When possible, children completed the Leiter Brief IQ[23] administered by a psychologist. All evaluators were blind to the child's medical history and each others' findings. Parents also completed a series of self-report questionnaires and a demographic questionnaire that included item's concerning the child's medical history.

2.2. *Behavioural measure*

Our primary outcome measure of behavioural attributes was the Strengths and Difficulties Questionnaire (SDQ), a 25-item behavioural screening questionnaire that documents the psychological adjustment of children aged 3–16 years of age. The SDQ has acceptable reliability and validity[24] and has been shown to be at least as good as the Child Behaviour Checklist (CBCL) at detecting conduct and emotional problems, better at detecting inattentive and hyperactive behaviours,[25] while having the additional advantages of being much shorter to administer and including attributes to assess prosocial behaviours. The SDQ has separate parent and teacher versions, and a self-report version for children between the ages of 11 and 16. The respondent is asked how much she/he agrees with an attribute using a 3-point Likert scale (0–2). The 25 attributes, both positive and negative, are divided into 5 equal domains of: Conduct Problems, Hyperactivity-Inattention, Emotional Symptoms, Peer Problems, and Prosocial Behaviour. Scores in each domain – excluding Prosocial Behaviour (i.e., positive social behaviours) – are summed to generate a Total Difficulties Score (TDS) for a maximum of 40 points. According to the developers, a TDS of 17 or higher corresponds to an abnormal behaviour, a score between 14 and 16 is considered borderline, and scores below 14 are considered within the normal range of behaviours.