Research in Autism Spectrum Disorders 8 (2014) 581–588

Contents lists available at ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: http://ees.elsevier.com/RASD/default.asp

Autism spectrum symptoms in children with cerebral palsy: Prevalence and co-occurring conditions

H.M. Bjorgaas [a,b,*], I. Elgen [b,c], H.K. Ryland [d,e], M. Hysing [e]

[a] Department of Pediatric Habilitation, Stavanger University Hospital, Stavanger HF, P.O. Box 8100, 4068 Stavanger, Norway
[b] Department of Clinical Medicine, University of Bergen, Norway
[c] Child Habilitation Unit, Department of Pediatrics, Haukeland University Hospital, Bergen, Norway
[d] Department of Pediatric Habilitation, Haukeland University Hospital, Bergen, Norway
[e] Regional Centre for Child and Youth Mental Health and Child Welfare, Uni Health, Uni Research, Bergen, Norway

ARTICLE INFO

Article history:
Received 29 November 2013
Received in revised form 28 January 2014
Accepted 28 January 2014

Keywords:
Autism spectrum disorders
Cerebral palsy
Mental health
Psychiatric disorders
Peer problems

ABSTRACT

Purpose: To explore autism spectrum symptoms in children with cerebral palsy (CP), and the association between autism spectrum symptoms and medical and psychiatric co-morbidity.
Methodology: Parents of children with CP in a Norwegian population were interviewed with a child psychiatric diagnostic instrument, and completed the Autism Spectrum Screening Questionnaire (ASSQ). Medical and socio-demographic data were obtained. ASSQ mean scores were compared to the Bergen Child Study (BCS), both to healthy controls and to subgroups of children with chronic illness in general, and neurological disorders specifically.
Results: Interviews and data collection were completed for 47 children, of whom 30 were boys, most had spastic CP, and were less severely affected by CP. Large effect sizes were found when comparing ASSQ mean scores in children with CP to children with chronic illnesses and normal controls. One in five children was ASSQ high scorers defined as a score above the 98th percentile of normal controls. A high rate of co-occurring psychiatric disorders, mainly AD/HD, was found in ASSQ high scorers.
Conclusions: More attention should be given to autism spectrum symptoms in the regular follow-up of children with CP in an attempt to enhance social functioning.

1. Introduction

Cerebral palsy (CP) is primarily a motor disorder, caused by a cerebral lesion occurring in the developing brain. It is one of the most prevalent neurological disorders in childhood, affecting 2–3/1000 children (Andersen et al., 2008). Motor impairment varies from mild to serious, and is often classified according to GMFCS (Gross Motor Function Classification System) levels I–V, where level V is the most disabling. Conditions co-occurring with CP, such as intellectual disability (ID), communication problems, epilepsy, pain, and psychiatric disorders, are commonly described (Bjorgaas, Hysing, & Elgen, 2012; Parkes et al., 2008; Parkes, White-Koning, McCullough, & Colver, 2009; Sigurdardottir et al., 2010).

The social functioning of children with CP has gained increasing attention, with parents reporting consistently more peer problems in children with CP than in controls (Brossard-Racine et al., 2012; Parkes et al., 2008, 2009). Most studies assessing

* Corresponding author at: Osterlide barnehabilitering, Stavanger University Hospital, Stavanger HF, P.O. Box 8100, 4068 Stavanger, Norway. Tel.: +47 98895956.
E-mail addresses: hanne.bjorgaas@lyse.net, bjhm@sus.no (H.M. Bjorgaas).

1750-9467/$ – see front matter © 2014 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.rasd.2014.01.011

social functioning have used short screening questionnaires covering peer problems, such as the Strengths and Difficulties Questionnaire (SDQ) (Brossard-Racine et al., 2012; Parkes et al., 2008, 2009). This questionnaire was also used in a recent Norwegian study, where parents reported peer problems in 90% of children with CP (Bjorgaas, Elgen, Boe, & Hysing, 2013). Why problems with social functioning are highly prevalent in children with CP, is an interesting question.

Intellectual disability is a well-known risk factor for both mental health problems and problems with social functioning (Parkes et al., 2008), and may account for some of the increased rates of peer problems in children with CP. Studies with focus on peer problems in children with CP have however been conflicting. Some studies have found ID significantly associated with peer problems (Parkes et al., 2009), or predictive of later peer problems (Yude & Goodman, 1999). Others however, have not found ID related to peer problems, but rather peer problems related to less severe motor impairment (Brossard-Racine et al., 2013).

Problems with social functioning have been described in children with other neurological conditions occurring in the developing brain, such as associations between developmental disorders, seizures in early life, intellectual disability (ID) and autism spectrum disorder (ASD) (Matson, Dempsey, Lovullo, & Wilkins, 2008; Saemundsen, Ludvigsson, & Rafnsson, 2007). This is further supported by results from a large scale epidemiological study using the Autism Spectrum Screening Questionnaire (ASSQ) (Ehlers, Gillberg, & Wing, 1999; Posserud, Lundervold, & Gillberg, 2009), where children with neurological disorders were found to have an increased rate of autism spectrum symptoms compared to their peers (Ryland, Hysing, Posserud, Gillberg, & Lundervold, 2012). Supporting the notion that peer problems in children with CP could be related to ASD, a diagnosis of Autism was found in eight percent of children with CP in a register study (Kirby et al., 2011). In a clinical study however, 14% of children with more severe CP met criteria for autism or pervasive developmental disorder (PDD) (Kilincaslan & Mukaddes, 2009). While shared etiology between CP and autism spectrum symptoms might be possible, the exact factors accounting for the overlap are still unclear.

Problems in social functioning may also be intrinsically related to other mental health problems, with considerable overlap between mental health- and peer problems demonstrated in children with CP (Parkes et al., 2008, 2009). A similar pattern was found between psychiatric disorders extensively overlapping with peer problems (Bjorgaas et al., 2012, 2013). Similarly, longitudinal studies have found AD/HD symptoms leading to later peer problems in children with CP (Yude, Goodman, & McConachie, 1998). The demonstrated problems related to social functioning, has spurred the interest in exploring autism spectrum symptoms, and the interplay between these symptoms and co-occurring medical conditions and psychiatric disorders in children with CP.

1.1. Aims of the present study

The aims of the present study were threefold; firstly, to explore the prevalence of autism spectrum symptoms using the ASSQ in children with CP. The second aim was to compare the rate of autism spectrum symptoms in children with CP to children with other chronic illnesses as well as to healthy peers. Thirdly, we wanted to explore if autism spectrum symptoms were related to medical- and psychiatric co-morbidity in children with CP.

2. Materials and methods

2.1. Population

2.1.1. Study population

All children with a diagnosis of cerebral palsy (CP) living in the Western Health Region of Norway, born in 2001–2003, were invited to take part in the study. The population has earlier been described in detail (Bjorgaas et al., 2012). In short, 67 of a total population of 98 participated. Children with the combination GMFCS level V and ID were excluded from the study as child psychiatric diagnostic conclusions were not possible (Bjorgaas et al., 2012).

2.1.2. Controls

The Autism Spectrum Screening Questionnaire (ASSQ) data obtained from children with CP were compared to those from the Bergen Child Study (BCS), a large longitudinal population study involving all children in the two Norwegian municipalities Bergen and Sund (Heiervang et al., 2007). Data collected when the children were 11–13 years old ($N = 5781$) were used as comparisons for the present study. Data from children with CP were compared to the general BCS population, and to a subgroup of children having chronic illnesses ($N = 496$), as well as a subgroup within the chronic illness group suffering from neurological disorders ($N = 99$). The BCS and the studies involving subgroups of children with chronic illness are described extensively elsewhere (Heiervang et al., 2007; Hysing, Elgen, Gillberg, Lie, & Lundervold, 2007; Hysing, Elgen, Gillberg, & Lundervold, 2009; Ryland et al., 2012).

2.2. Classification

Cerebral palsy was classified according to ICD-10 criteria with the following subgroups: spastic bilateral and unilateral, dyskinetic, atactic or not further classified.