Research in Autism Spectrum Disorders 6 (2012) 665–672

Contents lists available at SciVerse ScienceDirect

Research in Autism Spectrum Disorders

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

Sleep problems among Taiwanese children with autism, their siblings and typically developing children

Miao-Chun Chou [a], Wen-Jiun Chou [a], Huey-Ling Chiang [b,c], Yu-Yu Wu [d], Ju-Chin Lee [e], Ching-Ching Wong [f], Susan Shur-Fen Gau [b,g,*]

[a] Department of Child Psychiatry, Kaohsiung Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Kaohsiung, Taiwan
[b] Department of Psychiatry, National Taiwan University Hospital, Taipei, Taiwan
[c] Department of Psychiatry, New Taipei City Hospital, Taipei, Taiwan
[d] Department of Child Psychiatry, Chang Gung Children's Hospital, Chang Gung University College of Medicine, Taoyuan, Taiwan
[e] Department of Psychiatry, Taipei Medical University Hospital, Taipei, Taiwan
[f] Taipei Child Assessment and Early Intervention Center, Branch for Women and Children, Taipei City Hospital, Taipei, Taiwan
[g] Department of Psychiatry, College of Medicine, National Taiwan University, Taipei, Taiwan

ARTICLE INFO

Article history:
Received 19 September 2011
Accepted 21 September 2011

Keywords:
Autistic disorder
Children
Unaffected sibling
Parenting style
Sleep schedules
Sleep problems

ABSTRACT

The current study compared the sleep schedules, sleep problems among children with autism, their siblings and typically developing children, and to explore other associated factors with sleep problems. We conducted a case-control study consisting 110 children with autistic disorder, 125 unaffected siblings, and 110 age-, sex-, and parental education-matched typically developing children, aged 4–13 years old. We conducted psychiatric interviews to obtain DSM-IV diagnosis of autistic disorder and confirmed by the Chinese Version of the Autism Diagnostic Interview-Revised. The mothers were asked to report on the self-administered questionnaires regarding sleep schedules and problems of their children and parenting styles. Our results showed that children with autism had more sleep problems, including early insomnia, middle insomnia, sleep–wake schedule disorders and daytime napping. Their unaffected siblings also had more risk of early insomnia, sleep-talking and nightmares, compared to the typically developing children in non-autistic family. We also found an association between bring-up experience and nightmare, and between maternal overprotection and middle insomnia and sleep–wake schedule disorder. The findings of increased risks for sleep problems in both children with autism and their unaffected sibling suggest that parenting counseling should be included in intervention of sleep problems in children with autism and their siblings.

1. Introduction

Autism is a neuropsychiatric developmental disorder, characterized by three core behavioral symptoms: impaired social interaction, communication deficits, and restricted repetitive behaviors or interests. The incidence of autism spectrum disorders (ASD) has been increasing in past decade, and the reported prevalence rates were more than 1% in recent reports (Fombonne, 2009). Among the psychiatric comorbidities of ASD, sleep problems get more and more concerns from the parents and health professionals mainly because of the high prevalence of sleep problems in children with ASD, estimated in

* Corresponding author at: Department of Psychiatry, National Taiwan University Hospital and College of Medicine, No. 7 Chung-Shan South Road, Taipei 10002, Taiwan. Tel.: +886 2 23123456x66802; fax: +886 2 23812408.
E-mail address: gaushufe@ntu.edu.tw (S.S.-F. Gau).

1750-9467/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.rasd.2011.09.010

the range from 40% to over 80% (Liu, Hubbard, Fabes, & Adam, 2006; Polimeni, Richdale, & Francis, 2005). Besides, the sleep problems may impact on autistic symptoms and emotional and behavior problems (Malow et al., 2006) in children with autism, and also precipitate or aggravate sleep problems and psychological and physical distress of their parents (Doo & Wing, 2006).

The most common sleep problems in children with autism reported by parents are sleep initiation and maintenance problems (Malow et al., 2006; Wiggs & Stores, 2004), early morning waking (Polimeni et al., 2005), reduced sleep duration (Malow et al., 2006), circadian rhythm disturbance (Wiggs & Stores, 2004), and parasomnias (Paavonen et al., 2008a, 2008b; Tsai et al., 2011). In the literature, both the underlying neurobiological abnormalities and the psychosocial factors are proposed to predispose children with ASD to sleep problems (Richdale & Schreck, 2009). Although low parental hardiness was associated with child sleep problems in community samples (Johnson & McMahon, 2008), no study has been done to examine the relationship between parenting style and sleep problems in children with ASD. Furthermore, behavioral intervention for bedtime resistance and poor sleep routine in children with autism are emphasized in the clinical management (Doo & Wing, 2006; Liu et al., 2006). Therefore, we hypothesized that parenting style, such as less authoritative parenting, may be associated with sleep problems in children with autism and their siblings.

In contrast to dyssomnias, the prevalence of parasomnias in ASD population is inconsistently reported with some studies suggesting an increased prevalence (Couturier et al., 2005; Doo & Wing, 2006; Liu et al., 2006), and others showing no increase (Malow et al., 2006). This can be explained by inconsistent selective criteria of patient population (e.g., ASD, Asperger's syndrome or typical autism) and methodology (different questionnaires) across different studies. Therefore, we choose a homogenous group of children with DSM-IV autistic disorder in current study.

Although familial aggregation of insomnia, especially dyssomnia, has been proposed (Beaulieu-Bonneau, LeBlanc, Merette, Dauvilliers, & Morin, 2007; Zhang et al., 2009), there is a paucity of associated study about the unaffected siblings of children with autism. Since the unaffected siblings are at risk for emotional and behavioral problems in our previous study (Gau et al., 2010), which are also associated with sleep problems, we suppose that children with autism and their unaffected siblings have increased sleep problems. Therefore, the aims of this study were to investigate the sleep schedules, sleep problems among children with autism, their siblings and typically developing children, and explore other associated factors with sleep problems, such as bring-up experience, prenatal and peri-natal exposures, and parenting styles.

2. Method

2.1. Participants and procedures

The sample consisted of 110 children, aged 5–13 years old, who were clinically diagnosed with autism according to the DSM-IV diagnostic criteria for autistic disorder, 125 unaffected siblings, aged 4–13, and 110 matched comparison children without autism according to the distribution of age, sex, and parental educational level of the autism group. The clinical diagnoses of autism were made by board-certificated child psychiatrists with extensive clinical research experience, and assessment and intervention of children with autism. The Research Ethics Committee of the study sites approved the protocol prior to study implementation. Written informed consent was obtained from the parents of children with autism after explanation of the purpose and procedure of the study. The mothers were asked to report on the self-administered questionnaires regarding sleep schedules and problems, and parenting styles.

2.2. Measures

2.2.1. Sleep schedule and sleep-related problems

Items regarding sleep habits and problems were modified from the Sleep Habit Questionnaire (SHQ) used in our previous studies in preschool, kindergarten, elementary and junior high school students (Gau, Soong, & Merikangas, 2004) with operational definitions of each sleep problem in accordance with the DSM-IV "Sleep Disorders", if relevant. The SHQ was designed to survey children's current (past 6 months) sleep-related problems based on maternal reports. These sleep-related problems, which lasted for at least one month for the past 6 months, included (1) dyssomnia: early insomnia (sleep latency more than half an hour at least three times a week for one month), middle insomnia (waking up more than half an hour, at least once per sleep, three times a week for one month), disturbed circadian rhythm (different sleep–wake pattern from conventional schedules, i.e., sleep while others awake, and awake while others sleep); (2) sleep-disordered breathing (snoring and sleep apnea); (3) parasomnia: sleepwalking and sleep terrors (DSM-IV criteria), nightmares, bedwetting, sleep-talking and bruxism; and (4) others: restless leg syndrome, mouth breathing, and frequent daytime inadvertent napping. Binary response (yes, no) was used for reporting on the sleep-related problems and frequent daytime inadvertent napping.

2.2.2. The Chinese version of the parental bonding instrument (PBI)

The PBI is a 25-item instrument (item-rated on a 4-point Likert scale from "very likely" to "very unlikely") measuring parenting styles during the child's first 16 years with three principle dimensions. A high score on the Care subscale (12 items) reflects affection and warmth, while a low score indicates rejection, or indifference. The Authoritarianism subscale (6 items) reflects the degree of parental authoritarian control over a child's behavior; and the Overprotection subscale (7 items) reflects an overprotective parenting and denial of the child's psychological autonomy (Cox, Enns, & Clara, 2000). The