



Research Article

A REVIEW OF AUTISM SPECTRUM DISORDERS AND COMPLICATIONS

*Vijayasree. Bandikolla

Department of Human Development and Family Studies, Faculty of Home Science, Sri Padmavathi Mahila Visvavidyalayam (Women's University), Tirupathi, Andhra Pradesh, India

ARTICLE INFO

ABSTRACT

Article History:

Received 14th October, 2015
Received in revised form
29th November, 2015
Accepted 15th December, 2015
Published online 31st January 2016

Keywords:

Autism Spectrum Disorders (ASD),
Diagnosis and Sleep Disturbances.

Autism is a complex neurobehavioral disorder that includes impairments in social interaction and developmental language and communication skills combined with rigid, repetitive behaviors. The disorder covers a large spectrum of symptoms, skills, and levels of impairment. It ranges in severity from a handicap that somewhat limits an otherwise normal life to a devastating disability that may require institutional care. Pediatricians have an important role not only in early recognition and evaluation of autism spectrum disorders but also in chronic management of these disorders. The present study review indicates about Autism, Autism Disorders and symptoms, Neurophysiologic profiles, behavior problems, Diagnosis, General considerations and sleep Disturbances.

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INTRODUCTION

During the 1960s, it was generally assumed that autism was a rare seriously handicapping disorder, usually associated with intellectual disability and constituted a condition that was qualitatively distinct from variations in social and communicative competence within the normal range. (Malhotra, 2005, Williams *et al.*, 2006 and Rutter, 2005). Both genetic and epidemiological research findings have forced a change in concept as a result of the evidence that autistic like abnormalities are common and often occur in individuals with normal intelligence, particularly in first degree relatives of individuals with autism. The heritability or underlying genetic liability of autism spectrum disorder is about 90% - the highest figure among all multi-factorial child psychiatric disorders. Twin data also show that the genetic liability extends well beyond the traditional core diagnosis of autism to include a wide spectrum of autistic-like disorders autism spectrum disorders. There are good epidemiological data indicating that the true incidence of ASD is likely to be of the order of 30-60 cases per 10,000 as compared with the original estimate of 4 per 10,000 made some four decades ago. A recent study has reported the prevalence of childhood autism to be 38.9 and for ASDs to be 116.1 per 10,000 (Baird *et al.*, 2006).

*Corresponding author: Vijayasree. Bandikolla,

Department of Human Development and Family Studies, Faculty of Home Science, Sri Padmavathi Mahila Visvavidyalayam (Women's University), Tirupathi, Andhra Pradesh, India.

Autism and disorders

Autism spectrum disorders (ASDs) are defined clinically by impairment in communication, social interaction, and behavioral flexibility. In this review, ASD is used to include individuals with the full range of symptoms from the most severe form of the condition, autistic disorder or autism, to the milder forms, Asperger syndrome (AS) and pervasive developmental disorder not otherwise specified (PDD, NOS). Even within a diagnosis of autism, there can be a wide range of intellectual ability. ASD is clearly not a one size fits all diagnosis. There are many known etiologies that contribute to an ASD phenotype, including genetic variations (*e.g.* fragile X and tuberous sclerosis), environmental exposures (*e.g.* *in utero* valproic acid exposure), and prematurity. There also exists considerable phenotypic variation involving the pace of language development, the presence of epilepsy, and the range of cognitive ability. What does appear to be common to individuals across the spectrum are atypical behavioral responses to sensory information. More than 96% of children with ASD report hyper and hypo sensitivities in multiple domains. Similar to the wide range of spectrum severity found for communication and social deficits, sensory behavioral differences also range from mild to severe, and these behavioral differences can endure through adulthood (Minschew *et al.*, 2002, Blakemore *et al.*, 2006, Leekam *et al.*, 2007, Tomchek and Dunn, 2007, Crane and Goggard, 2009).

Sensory processing concerns have been a key feature of ASD clinical descriptions from the original independent seminal reports by Asperger (Asperger 1994). The distress caused by particular sensory stimuli can cause self-injurious and aggressive behavior in those who are unable to communicate their distress. Although sensory hyper- and hypo responsiveness are not unique to ASD, they appear to be more prevalent in this population than in other developmental disabilities (Leekam *et al.*, 2007, Ben-Sasson *et al.*, 2009, Baranek *et al.*, 2006). There is limited consensus regarding the pattern of these sensory deficits in ASD. However, historically, proximal senses such as touch, smell, and taste were thought to be particularly at risk and to indicate developmental immaturity (Kanner, 1943 and Grandin, 1995). Interestingly, these tend to be the least well studied of the sensory modalities, whereas there is mounting evidence for disruption of the auditory and visual processing pathways and a surging interest in multisensory integration (MSI).

Autism and Brain development

Strong evidence suggests that AD is an organically based neurodevelopment disorder which is associated with abnormalities in brain structure and function. Reduced number of Purkinje cells in the posterior inferior regions of the cerebellar hemisphere. Truncation in the dendritic tree, development of neurons in the limbic system (Minshew, 1996 and Brumann, 1996). Hypoplasia of cerebellar lobules VI and VII. (Courchene *et al.*, 1988). Size of the brain stem structures and the entire cerebellar vermis and their components were significantly smaller in an autistic group than in control group, which was found on using magnetic resonance imaging (Hasimoto *et al.*, 1995).

The diagnosis

The diagnosis of autism often is not made until 2 to 3 years after symptoms are recognized, primarily because of concerns about labeling or incorrectly diagnosing the child. Identifying children with autism and initiating intensive, early intervention during the preschool years results in improved outcomes for most young children with autism. 3-7 Early diagnosis of autism and early intervention facilitates earlier educational planning, provisions for family supports and education, management of family stress and anguish, and delivery of appropriate medical care and treatment. (Rogers, 1998, Lovaas, 1987. McEachin, 1993 Ozonoff, 1998 and Sheinkopf, 1998).

Identification of children with autism

Parents often struggle to obtain an accurate explanation for their child's atypical behavior, communication and overall development and Their struggle is complicated if their primary care providers are not trained or supported to readily respond to their concerns by recognizing the early warning signs for ASDs, by giving adequate time and attention to routine developmental assessment, and by referring on for further diagnostic workup if problems are suspected.

In addition, while increasing attention is being given to diagnostic instruments that are based on the symptom patterns of infants and children (Filipek *et al.*, 2000) diagnosis remains challenging with very young children because the symptoms are complex, different and evolving (Rodgers, 2001). Clinically identifying children with autism requires two levels

of investigation, each addressing a distinct component of patient management. The first level, Routine Developmental Surveillance and Screening Specifically for Autism, should be performed on all children and involves first identifying those at risk for any type of atypical development, followed by identifying those specifically at risk for autism. Mental retardation or other medical or neuro developmental conditions require separate evaluations and are not within the scope of this document.

General Considerations

Like any other growing and developing child, children with ASD have basic health care needs, and benefit from health promotion and disease prevention activities, such as immunizations (see also below). However, children with ASD often have additional healthcare needs that can be related either to their underlying ASD (such as behavioral concerns) or the medical conditions that are commonly associated with ASD (e.g., certain genetic syndromes, epilepsy, pica). Approximately 21,300 children with autism reside in Pennsylvania¹. Autism spectrum disorders are biomedical brain disorders characterized by impaired social interaction, problems with verbal and nonverbal communication, and unusual, repetitive, or severely limited activities and interests. Since there is no cure, individuals with autism have extensive health and support needs to control symptoms, such as behavioral interventions, medications and medical services (Ganz, Michael, 2006).

American Academy of Pediatrics (2000) Fellows Survey. Elk Grove Village, Ill. AAP. (A national sample of 794 AAP members who provide primary care to children from birth to age 3 were surveyed. Overall most members agreed that pediatricians should inquire about a child's developmental status (94%) and felt confident in their ability to advise parents (80%). However two-thirds felt that they were not adequately trained to conduct developmental assessments. Other primary barriers reported were lack of time (80%), inadequate reimbursement (55%), and lack of non-physician staff to do developmental assessments (55%) (Filipek *et al.*, 2000).

Sleep disturbances

Sleep problems are common in children and youth with ASDs. In some cases, there may be an identifiable medical cause, such as obstructive sleep apnea or gastro esophageal reflux. (Myers and Johnson, 2007). When there is not an identifiable medical cause, behavioral interventions are often effective, and there's some evidence that melatonin may be effective for improving sleep onset in children with ASDs (as well as children with other developmental disabilities). The functional criteria are: Having a diagnosis of autism spectrum disorder, childhood disintegrative disorder, pervasive developmental disorder-not otherwise specified, disorder as determined by a licensed psychologist or physician¹ (Diagnostic and Statistical Manual of Mental Disorders, 1994).

Sleep problems are common in children and adolescents with ASDs at all levels of cognitive functioning. Sleep problems correlate with family distress and may have significant effects on daytime functioning and quality of life of children with ASDs. In some cases, there may be an identifiable etiology

such as obstructive sleep apnea or gastr oesophageal reflux; assessment and treatment are guided by history and physical examination. When there is not an identifiable medical cause, behavioral interventions including sleep-hygiene measures, restriction of daytime sleep, positive bedtime routines, and extinction procedures often are effective (Malow, 2004; Williams *et al.*, 2004, Patzold *et al.*, Tordjman *et al.*, 2005, Christodulu and Durand, 2004).

Relatively little empirical information is available regarding pharmacologic management of sleep problems in children with ASDs or other developmental disabilities. Recommendations typically are based on case reports and open-label trials, extrapolation from the adult literature and expert consensus. There is some evidence of abnormality of melatonin regulation in children with ASDs and melatonin may be effective for improving sleep onset in children with ASDs as well as children with other developmental disabilities and otherwise healthy children with sleep/wake disorders. A recent open-label study suggested that controlled-release melatonin improved sleep in a group of 25 children with ASDs and that treatment gains were maintained at 1- and 2-year follow-up but randomized, double-blind, placebo-controlled studies are needed. Recently, a child and a young adult with ASDs with significant insomnia were reported to have responded well, with no apparent adverse effects, to open-label treatment with the high-affinity melatonin receptor agonist ramelteon. (Owens *et al.*, 2005, Jan and Freeman *et al.*, 2004, Turk, 2003, Giannotti *et al.*, 2006 and Stigler *et al.*, 2006). Antihistamines, α_2 -agonists, benzodiazepines, chloral hydrate, trazodone, and newer nonbenzodiazepine hypnotic agents, such as zolpidem and zaleplon, sometimes are used to treat pediatric insomnia. In some cases, other conditions or symptoms, such as epilepsy, depression, anxiety, or aggressive outbursts, warrant pharmacologic treatment, and an agent that also may assist with sleep can be chosen.

There are no specific community-linked studies on prevalence or incidence of autism or ASD in India. This is a serious gap because these disabling disorders can no longer be considered rare, with the more recent estimates placing the prevalence rate among children at about 1-4% which is quite similar to that of schizophrenia and bipolar disorder in adults. Prevalence studies are of value in planning diagnostic and intervention services. Detailed studies incorporating disability measurement will help identify the need for a range of services in health, education and social care (Malhotra, 2006).

Treatments

Many treatments (Tx) have been proposed for Autism Spectrum Disorders (ASD) with the most effective being combined Tx involving specialized and supportive educational programming, communication training (e.g., speech/language therapy), social skills support, and behavioral intervention (Lord and McGee, 2001). Occupational and physical therapy also may promote progress by addressing comorbid difficulties of motor coordination and sensory deficits (Myers *et al.*, 2007).

Conclusion

Autism is a serious, lifelong developmental disability characterized by significant impairments in reciprocal social interactions and communication skills, as well as a

restricted/repetitive pattern of interests and/or behaviors. Assessment and services are needed early in an individual's life and for an extended period of time to mitigate behavioral and cognitive issues associated with autism. Early detection and adoptive intervention programs, proper measures and care should be taken in order to avoid severity of autism and also to reduce the (population) rate of autism among children.

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