

Sleep Disorder, Gastrointestinal Problems and Behaviour Problems Seen in Autism Spectrum Disorder Children and Yoga as Therapy: A Descriptive Review

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ABSTRACT

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder with deficiencies in many developmental milestones during the infantile childhood. Recent researches have shown that apart from behaviour problems, the ASD children also suffer from physiological conditions such as disturbed sleep and gastrointestinal problems that could be the contributing factors to their daytime behaviour problems. Lots of parents have expressed that, lack of sleep among the children have resulted in high levels of stress among the family members particularly among the immediate caretakers which are in most cases the mother of the child. Early behaviour intervention is a norm for ASD children which mainly affect the psychological level. Through this paper, an effort has been made to study the contributions made by yoga in order to mitigate such problems. Yoga is a non-invasive and alternative therapy that brings change in both physiological and psychological level of an individual. High levels of stress among the caretakers of these children could make them susceptible to non-communicable diseases such as hypertension, diabetes, arthritis etc. Parental based yoga intervention can be more effective for both children and parents and subsequently to the entire family.

Keywords: Neuro-developmental, Non-invasive, Parental, Physiological, Psychological

INTRODUCTION

Way back in 1943, Leo Kanner a child psychiatrist observed a group of 11 children and found that the behaviour of these children were totally different from a typically growing child. He then published an article of about twenty pages in a journal called "Nervous Child" which is extinct now [1]. After Kanner's publication in 1943, Hans Asperger in Austria further studied and published an article about autism in 1944 [2]. Due to number of deficiencies in these children, the word Autism Spectrum Disorder (ASD) was framed. In Greek the meaning of the word 'auto' is self. Autism is one of the complex neurodevelopmental disorder, the characteristic of which is manifested in the form of impairments in social communication and interaction, peer communication, repetitive and restricted behaviour, adhering to sameness, stereotyped pattern of behaviour and in some cases hyperactiveness and attention deficit problems. Autism is just one of the spectrum disorders under the umbrella of pervasive developmental disorders, the others being Asperger's Syndrome, Rett's Disorder, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) and Childhood Disintegrative Disorder. ASD children have normal life span like any other individual. Autism is not a single disorder but it refers to behavioural phenotype. Since, no aetiology can explain this disorder, aetiological based intervention is also not available [3]. Onset of autism happens in infantile childhood somewhere between 18 months to 30 months. Cause of autism is not yet precisely known, but suspected causes could be genetics, presence of toxins in the environment, maternal related complications, pregnancy related problems, marriages in blood relatives and certain vitamin deficiency etc., [4,5]. Recent studies seem to be pointing at various physiological and metabolic abnormalities in ASD other than psychiatric disorders such as immune dysregulation or inflammation, oxidative stress, mitochondrial dysfunction and exposure to environmental toxicants [6].

Prevalence of ASD population has increased by many folds in recent years. In 2006, 1 child in every 110 children was suffering from ASD (1:70 male and 1:315 female) [7]. Then according to

revised estimation in 2010 it was 14.7 per 1000 (1 in 68) children considering the age of 8 years old [8]. According to the Centre for Disease Control which monitors these numbers through Autism and Developmental Disabilities Monitoring Network (ADDM) the community report of 2016 in United States, the occurrence of ASD was found to be same as in previous report, that is 1 in every 68 children [9]. Cost involved in caring and maintaining ASD children is huge on both, the families of these children and the community. It is estimated that, the total cost per year from the time of the ASD child's birth until the age of 17 years is found to be between \$11.5 billion to \$60.9 billion in United States [10]. In United Kingdom the prevalence rate is estimated to be 1% of the total population after using various methods of diagnosis [11].

Prevalence in India: Earliest literature available in India about autism dates back to 1944 by a Viennese paediatrician A. Ronald, working in Darjeeling. In the same year as that of Kanner's publication, Ronald also presented an overview of the detection, causes, types and treatment for what he termed as abnormal children. Later in 1959 the word autism was first used in Indian literature and by 1960 few more publications appeared [12]. In India ASD population is estimated to be 2.3 million considering the metropolitan and urban population [12]. There seems to be a lack of awareness about autism disorder in rural population and therefore, it is very difficult to estimate this population.

Recent researches show that other than behaviour problems, ASD children also suffer from physiological problems like sleep disorders, gastrointestinal problems etc., which may aggravate the severity of day time behaviour.

Sleep disorder: Sleep is one of the basic needs of human beings like food that we take to sustain. Both food and sleep are physiological needs of human body. Studies on sleep problems of ASD children are very scarce. Initiating and maintaining sleep for longer period among ASD children is very difficult [13]. If sleep is disrupted then, it affects academic behaviour and other activities during day time. Sleep disorder is a common concern for individuals with ASD children. Evidence suggests that there seems to be significant sleep

problems with ASD children [14]. Rate of disturbed sleep is very high among ASD [15]. The sleep problems exacerbate symptoms of autism [16]. Due to disturbed sleep or lack of sleep at night most of the ASD children behave aggressively during daytime which makes it difficult for the caretakers in general and mothers in particular to manage them. Sleep disorders among ASD children can also result in disturbed sleep among family members. Identification and proper treatment of sleep disorders of both the child and the adult is an important factor in treating the ASD children. This will help in better management of daytime behaviour problems. The ASD children's sleep disorders include refusing to go to bed, insomnia, sleepiness during day time, sleep apnoea etc., [17]. Difficulties pertaining to sleep and patterns of disrupted sleep can have a negative effect on academic, emotional, behavioural, physical and social functioning. Early detection of sleep disorders among ASD children and use of properly utilized strategies by qualified professionals may prove to be helpful to these children [18]. Due to indifferent sleeping patterns of the ASD children, the routine of the entire family gets disturbed causing them to undergo a lot of stress particularly for the immediate care taker which in most cases is the mother.

Gastrointestinal problems: The other medical condition which require immediate attention is Gastrointestinal (GI) problems [19]. GI problems among subsets of autism individuals leads to chronic constipation, diarrhoea, abdominal pain, bloody stools, vomiting and flatulence etc., [20]. GI symptoms are associated with inflammation in intestinal tract, irritation bowel syndrome, bloating and other digestion related problems. Some ASD children always insists to have particular type of food due to which imbalances in the diet may happen [21]. GI problems and associated symptoms are very common among autistic children but these conditions are not completely understood [22]. Most of the children don't chew the food properly and swallow instead and this may lead to digestion problems. Some children may not eat fruits, vegetables or some food which should be a part of their daily balanced diet. GI problems may be associated with compositional changes in intestinal bacteria [23]. All these problems may lead to imbalanced food and nutrition supply to body. In paediatric sittings, parents often raise concern about possible GI symptoms in ASD, yet the specificity of these concerns are not well studied. Gastrointestinal Dysfunction (GID) in ASD children is not properly understood [24]. Factor associated with GID could be atypical eating habits of ASD children when compared to normal children. All these days it was considered as the parents' perception of GID in ASD children [25]. Due to communication problems associated with the ASD children, it is very difficult to understand this issue. Experts in this area need to understand whole issue related to GID of ASD children instead of relying on opinion of parents as parents themselves may not be experts in determining the GID problems of their children. A subgroup of ASD children suffer from symptoms like belching, constipation, bloating, abdominal pain reflux, vomiting, flatulence etc. Some of the ASD children also suffer from urine and faecal incontinence problems [26].

Behaviour problems: More importance is being given to behaviour interventions for ASD children and it is the only intervention available right now in conventional methods. ASD children disconnect themselves from external world and involve in self stimulatory behaviours, self injuring like biting, head banging, unusual talk or peculiar sounds, running around without purpose, lack of sitting tolerance, lack of attention, learning disability etc. An individual with ASD requires behaviour interventions throughout life since, it is a pervasive developmental disorder. Behaviour intervention is needed in multiple areas such as social behaviour, social communication and interaction, psycho-social behaviour, motor movement, sensory integration, intellectual disability, cognitive difficulties, life skills problems, to control self-stimulation behaviours, defiance behaviours, rigidity, repeated restricted behaviour problems etc. ASD children also suffer from depression and anxiety and

require psychiatric treatment. In case of an individual with autism who is adult or is in older age hospitalization may be required for psychiatric treatments [27]. Psychiatric comorbidities have been reported to be 72% among infantile childhood of autism children [28]. To some extent behaviour interventions are found to be successful which helps some children to do better in academic and social communication etc. ASD children are unique and they differ from each other in patterns of behaviour. Early diagnosis and intervention play a major role in improving the health and behaviour of ASD children. Other than high functioning autistic children with good communication skills, most of the children are associated with deficit expressive and receptive language skills.

Yoga as therapy: Availability and role of Pharmacological intervention is limited to ASD children. Integrated approach of yoga helps children to improve imitation skills, social communication and also helps in improving the overall quality of life [29]. Attempts have been made to identify safe and effective complementary and alternative therapy for the families of ASD children [30]. Yoga acts as sensory integration which helps children to overcome excess stimuli in their life [31]. Since, the children require individual attention even for behavioural intervention, the cost of the intervention is too high. ASD children suffer from attention deficit and yoga helps in overcoming this problem [32]. Most of the parents cannot afford intervention particularly in India due to poor financial background of the majority of the families [33]. Such parents go in search of low cost alternative medicine and therapies. As the prevalence of ASD children increase so does the need for alternative therapies for effective intervention to reduce the intensity of symptoms. Integrated movement therapy involving yoga bring changes in speech, language pathology and overall mental health [34]. There has been increased interest in developing effective intervention for ASD children. Yoga has been found to bring positive effects on mental health of the ASD children [35]. Yoga is an ancient science being practiced in India for thousands of years. The meaning of the word yoga is oneness or to join two in to one that is to unite body and mind [31]. Yoga also helps in improving sensory integration, motor movements and increase in cognitive ability, social communication and interaction etc. By practicing pavana mukthasana set of asana (wind releasing exercises) GI symptoms which lead to digestion related problems can be solved. Breathing practices and meditation helps in psychological problems like concentration, increasing attention span and memory power. By practicing dynamic exercises and loosening exercises excessive energy can be controlled which helps in reducing hyperactiveness of children. Yoga is a form of alternative therapy for those having ASD. Yoga acts as a form of sensory integration therapy which helps ASD children cope with the overload of stimuli in their day to day life. Care takers particularly mothers are prone to excessive stress in managing ASD children. Keeping this in mind mothers should also be made part of any yoga intervention of ASD children. Apart from assisting trainers in making child perform yoga, they can learn yoga themselves which can help them in reducing the stress level in dealing with autistic children.

CONCLUSION

Affordable and effective pharmacological interventions are yet to be found for ASD based on aetiology of disorder. Since, effect on behaviour intervention is limited, parents go in search of alternative and complementary medicine or therapies to find relief for their children. Yoga being accepted by people all over the world either to find cure or to control different ailments, definitely it will be more effective in case of ASD children also. Yoga affects both physiological and psychological level which helps in overall development of ASD children and thus, enhancing the quality of life of children as well as family. Yoga can be used as best alternative therapy which has no side effects. Yoga should be a routine and part of day to day activity for ASD children. If yoga is practiced regularly, it can be used as a preventive therapy to keep away many non-communicable diseases

like diabetes, hypertension, arthritis etc. among the caretakers. Since, ASD children require individual attention and physical prompt in doing any activity, parental based yoga interventions will prove to be a successful program. With short duration of yoga intervention we see improvements in physiological conditions but longer intervention is required to see changes in psychological symptoms. Yoga teaching should be mandatory or a part of special school curriculum to make it more effective for ASD children.

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