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Case Report

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Investigation of the Effect of Sensory Integration Therapy and Foot Reflexology Applications on Sensory Modulation and Sleep in a Case with Autism

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Abstract

Purpose: The aim of this study is to examine the effect of sensory integration therapy and foot reflexology on sensory modulation and sleep habit in a children with autism.

Method: Children's Sleep Habits Questionnaire (CSHQ) and the Adolescent/Adult Sensory Profile Questionnaire (ASPQ) were applied before the intervention. The case (12 years old male), who was constantly in motion and intensely observed stereotypical movements, performed 40 minutes of sensory integration therapy and 20 minutes foot reflexology once a week for eight weeks. The assessments were repeated after eight weeks.

Results: According to the Adolescent/Adult Sensory Profile results, sensory sensitivity section was calculated as 51 points and sensory avoidance section was calculated as 52 points, and it was observed that there were more sensitivity and avoidance responses than the typical situation. According to the results of the post-intervention evaluation, the sensory sensitivity score was reduced to 40 and the sensory avoidance score to 50, and it was determined to be within the similar score range. It was calculated that the scores decreased from 31 to 27 in taste / smell process, from 38 to 33 in auditory process and from 25 to 17 in sensory process related to movement. CSHQ total score improved from 70 points to 39 points and showed a positive improvement.

Discussion-Conclusion: It was concluded that the practice of foot reflexology together with sensory integration therapy had positive effects on sensory modulation and sleep habits in a patient with autism and sleep problems. In the future, it is recommended to plan longer follow-up studies with more cases, comparing the effectiveness of sensory integration therapy and reflexology practices on sleep.

Keywords: Autism, sensory integration, reflexology, sleep problems

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that begins in early childhood with insufficient social communicative development, repetitive behaviors and limited areas of interest. In recent studies, it has been reported to be seen with a frequency of 1/68. Although its etiology is not known clearly, it is thought that psychosocial, prenatal-postnatal factors, neurobiological factors and genetic predisposition may be effective in the emergence of the disorder. Sleep problems, one of the common problems in individuals with ASD, have not received enough attention and been neglected until recently. It is known that there is a two-way and complex relationship between sleep and brain development, that sleep has an effect on brain development, and brain development on sleep. Insufficient and divided sleep is known to have negative effects on cognitive development, attention, learning, mood, memory and behavior. Sleep problems seen in individuals with ASD affect the clinical table and behavior negatively. For this reason, it is important for the therapists to question sleep characteristics and determine their relationship with functionality and behavioral problems. (1,2).

Reflexology is an alternative medical practice that obtains beneficial effects on the human body by applying pressure to certain points or areas on the feet and hands, called "reflex areas".

Each reflex area is thought to correspond to various parts of the human body or organs and these areas are mapped on the hands and soles of the feet. Reflexology method can be used in the treatment of many different problems like anxiety, panic attack, exam stress, depression, lumbar-neck hernia, joint pain, attention deficit, autism, cerebral palsy, motor retardation, musculoskeletal problems, migraine, hormone disorders, asthma, insomnia, indigestion and speech disorder. (3,4).

Although the importance of early diagnosis and intervention is known, there are a limited number of studies involving interventions for the early sleep problems of children with ASD.

In this study, we aimed to investigate the effects of sensory integration therapy and reflexology on sensory modulation and sleep quality in a 12-year-old male patient diagnosed with autism (5-7).

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Method

The study was conducted between January and March 2020 on a 12-year-old male patient with autism who applied to the Beta Rehabilitation Center. Since the participant in the study was younger than 18 years old, an informed consent form was signed by his parents. In the first interview, the patient's restlessness, inability to adapt to changes, repetitive movement patterns and sleep problems were verbally expressed by his parents. Sensory integration therapy (40 minutes) and foot reflexology (20 minutes) were applied to the patient once a week for eight weeks. Before and after the intervention, Child Sleep Habits Questionnaire (CSHQ) and Adolescent / Adult Sensory Profile Questionnaire (ASPQ) were applied (8).

Adult Sensory Profile Questionnaire is a standardized test consisting of 60 items, evaluating six sensory models and the response to different sensory stimuli. Taste / smell (response of people to tastes and smells), movement (response of individuals to sensory and vestibular stimuli), visual (response to visual stimuli), touch (response to stimulation of skin and tongue touch), auditory development (response to hearing) and evaluates the level of activity (participation and disposition in daily life activities).

This questionnaire, which is used for adolescents and adults aged 11 and over, consists of four subscales based on Dunn's sensory processing theory.

1. Sensory sensitivity (having a low threshold against sensory stimuli, responding to stimuli more than normal),

2. Sensory avoidance (deliberately avoiding sensory stimuli),

3. Low record (responding to sensory input more or less slowly than normal),

4. Sensory search (enjoying sensory inputs, sensory seeking).

The evaluation can be applied according to the norm values established in three different age ranges for 11-18, 18-65 and over 65 years old. At the end of the questionnaire, the individuals were in four sub-scales; much more than most people, more than most people, similar to most people, less than most people, a lot less than most people. (9, 10).

The Child Sleep Habits Questionnaire (CSHQ) is a 33-item scale developed by Owens et al in 2000 to investigate children's sleep habits and sleep-related problems. The CSHQ, which is filled mostly by parents,

is accepted as a valid and reliable scale for evaluating sleep problems. (8). Eight subscales were defined in the scale, which can be listed as sleep time resistance (items 1, 3, 4, 5, 6 and 8), delayed falling asleep (item 2), sleep duration (items 9, 10 and 11), sleep anxiety (5,7,8 and 21 items), night awakenings (items 16, 24 and 25), parasomnias (items 12,13,14,15,17,22 and 23), sleep breathing (items 18,19 and 20), being sleepy during the day (items 26,27,28,29,30, 31,32 and 33) were defined. The Turkish version of the scale has been used and it has Turkish validity and reliability (9).

In the case, whose sensitivity in odor, auditory and movement processes was intense, within the scope of sensory integration therapy intervention program, tactile, propsioceptive, vestibular and visual studies, music listening, essential apple and jasmine oil were used together and practices aimed at relieving sensitivity were performed (11-13).

Within the scope of the foot reflexology program, rotation, Achilles stretching, bilateral wrist relaxation, milking, longitudinal walking, horizontal walking, foot arches, foot dorsal, finger crossing, diaphragm opening, spinal bending, crossing techniques were applied for sleep problems (14).

Results

When the results of the CSHQ and ASPQ applied before and after the 8-week intervention program were examined, positive differences were observed in the case compared to the baseline level. According to the first evaluation results of the ASPQ, sensory sensitivity was calculated as 51 points, and the sensory avoidance section was calculated as 52 points, and more sensible and avoidance responses than the typical situation were determined. In the post-intervention evaluation, it was observed that sensory sensitivity decreased to 40 points and sensory avoidance decreased to 50 points, reaching a similar score range with the typical condition. In addition, it was observed that there were decreases from 31 to 27 in the taste / smell process, from 38 to 33 in the auditory process and from 25 to 17 in the sensory processing related to movement (Table 1).

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Table 1. ASPQ Sensory Profile Questionnaire before-after intervention results

ASPQ	Before intervention	After intervention
Tasting / Smelling Process	31	27
Movement Processing	25	17
Visual processing	32	26
Tactile processing	36	29
Activity level	36	32
Auditory processing	38	33
Record	39	34
Search	48	43
Sensibility	51	40
Avoidance	52	50

When the total results of CSHQ pre and post intervention were compared, it was seen that it showed a positive improvement, decreasing from 70 points calculated in the first evaluation to 39 points (Table 2.)

Table 2. The Results of Positive Improvement,

CSHQ	Before intervention	After intervention
Sleep-time resistance	11	6
Sleep anxiety	8	5
Sleep duration	9	3
Panosomnia	12	7
Delaying falling asleep	3	1
Waking at night	8	3
Sleep breathing	9	8
Sleepiness	10	6
TOTAL	70	39

Discussion

It is known that children and adolescents with ASD have sleep problems regardless of their age and intelligence level. Studies investigating the prevalence of sleep problems in ASD with data based on parental reporting have showed sleep problems with a rate of 50-80%. Although sleep problems are frequently reported in healthy children between the ages of 0-6, this rate is 25%. (7). In a study by Richdale et al., it was found that children whose parents have sleep problems exhibited delayed falling asleep and more sleep interruptions, unlike those who did not report sleep problems, and showed that these findings were reflected in the subscale scores of the CSHQ (13).

In a study conducted in 2018, in which Qigong sensory therapy was applied to individuals with autism, it was concluded that the application regulated sleep functions by stimulating the parasympathetic system (15).

Our study showed that the application of foot reflexology together with sensory integration therapy had positive effects on sensory modulation and sleep habits in a patient with autism who had sleep problems. There is no study in the literature involving reflexology intervention for sleep problems in autism. In this respect, we hope that our work will be inspiring.

The case in our study was constantly in motion, stereotypical movements and sleep problems before the therapy, and decreased stereotypical movements after eight weeks of therapies, and positive behavioral changes were reported by his parents.

In the future, it is recommended to plan studies with longer follow-up, including more cases, to compare the effectiveness of sensory integration therapy and reflexology applications on sleep problems and other problems in individuals with autism.

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