

# How sensory integration disorder can contribute to sleep disturbances in autistic children

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Children with Autism Spectrum Disorder (ASD) are at an increased risk for sleep disturbances, and studies indicate that between 50 and 80% of children diagnosed on the autistic spectrum experience sleep problems.<sup>1</sup> One area that is challenging for many autistic children is their ability to receive and interpret sensory stimuli. This author will focus on the impact that dysregulation of the sensory processing system may have on sleep disturbances in this population and interventions to assist with proper sleep.

Statistics published in the *Journal of Pediatric Neuroscience* in 2015 reported the following instances of sleep issues in autistic children:

- 54% displayed resistance to bedtime
- 56% experienced insomnia
- 53% suffered from parasomnias, such as sleepwalking or night terrors
- 25% experienced sleep disordered breathing, including sleep apnea
- 45% had difficulty waking up in the morning
- 31% experienced daytime sleepiness<sup>2</sup>

This year (2022) in a scoping review, Lane et al wrote that “the incidence of sensory reactivity differences in autism exceeds that in the neurotypical population. The basis of sleep disorders in autism is multifactorial, but sensory integration/processing concerns may play a role. Research that investigates this interplay for autistic individuals is limited but vital.”<sup>3</sup>

A study in the *Journal of Molecular Autism* examined the relationship between sleep disturbances and sensory sensitivities in autistic children. This study found a correlation between tactile, visual, auditory, and oral sensitivities and sleep disturbances in children with autism. Tactile hypersensitivity was found to be the most frequent cause of sleep disturbance scoring 25%.<sup>4</sup>

The study from the *Journal of Pediatric Neuroscience* gives a framework for the varied presentations of sleep disturbances experienced by autistic individuals. The reasons for these disrupted sleep patterns are varied and are most likely caused by neurological, physiological, and environmental factors.<sup>2</sup> People with autism will have varied responses to stimuli but most are classified into two categories; hypersensitivity and hyposensitivity. A child with hypersensitivity is described to have a heightened sensitivity to stimulation. For example, accidentally bumping into a child may not bother a child with a typical neurological response however this same bumping into could be very overwhelming and disruptive

to a child with tactile sensitivity. Therefore, a child going to sleep may be overwhelmed by the feel of their pajamas or sheets or a sibling in the same bed and this may impact their ability to sleep. The child with hyposensitivity to tactile input may need a weighted blanket or compression blanket to stimulate the deep joint mechanoreceptors and help them regulate their autonomic nervous system to fall asleep. Each of the senses including the tactile, auditory, vestibular, visual, olfactory, and proprioceptive have input to the sensory system. Any or all of this input can be misinterpreted (“jumbled up”, heightened (sensory overload) or dampened (sensory deprivation) and any dysfunction or alteration in “reception” can result in sleep disturbances.

Interventions should be aimed at helping the person to normalize neurological responses to stimuli, help regulate bodily functions and create an environment that supports sleep.<sup>3,5</sup>

## Interventions

### *Qi Gong Sensory Treatment*

In Chinese Medicine autism is characterized by a block of one or more of the sensory pathways and stimuli cannot be properly received and processed. “The sensitivity of one or more of the sensory channels disturbs the normal flow of Qi, causing deficiencies or accumulations inside the head. These phenomena cause the many different hyper- and hyposensitivities that autistic children show in response to touch, pain, noise, taste, olfactory and visual stimuli.”<sup>6</sup> Qi Gong massage aims to clear the accumulations and strengthen the deficiencies of Qi the child is exhibiting. This treatment is taught to parents and supported with treatment from a Qi Gong Sensory Treatment (QST) therapist for at least five months. The person giving the massage uses their hands to provide a tapping (clearing) or pressing (deep pressure) touch down the acupuncture meridians. The person giving the massage monitors the child’s responses and will change the movement to help either move an energy blockage or to fill the emptiness where the energy is not flowing.

“Research shows that pleasure and bonding with gentle touch are mediated by tiny sensory nerves in the skin, and when these nerves are damaged, children lose pleasure and bonding with touch. Fortunately, the damage is reversible, and treatment with QST for autism returns the sense of touch to normal. This improves bonding, stimulates social development, and eliminates autistic behavior.”<sup>7,8</sup>

### *Cranial Sacral Therapy*

Cranial Sacral Therapy<sup>9</sup> is a light touch therapy that aims

to balance the craniosacral system. The cranial system is comprised of fluid that surrounds and cushions the brain and spinal cord, providing nutrients and removing waste material. Treatment of this system uses light touch to release bone and membranous restrictions. This treatment helps to balance the autonomic nervous system.

The focus of CST is to enhance the movement of:

- The three fascial membrane layers surrounding the brain.
- The fluid (blood and cerebrospinal fluid) moving through the vessels (blood/lymph) of the cranium and throughout tissues of the central nervous system (brain and spinal cord)
- Address adhesions, restriction or tension in areas of the body that are adjacent to the craniosacral system causing fascial strain that inhibits the normal cranial sacral rhythm within the system.

This light work promotes improved self-regulation of the autonomic nervous system therefore helping to normalize many physiologic functions overall. Cranial sacral therapy is a gentle but clinically effective modality. While gentle, practicing craniosacral therapy requires advanced training as it involves very specific application of very gentle techniques which, when applied correctly, can produce very significant results.<sup>10</sup>

#### *Occupational Therapy — Ayres Sensory Integration*

Although it is beyond the scope of this article, the Ayres Sensory Integration intervention is one of the most frequently requested and highly utilized interventions in autism from the occupational therapists. This intervention has specific requirements for therapist qualifications and the process of therapy. A systematic review done in 2015 requesting further rigorous research was needed was followed up in 2019 with another systematic review of studies providing Ayres Sensory Integration therapy to children with autism indicating that it is an evidence-based practice according to

the criteria of the Council for Exceptional Children and is another avenue for parents to explore.<sup>11,12</sup>

#### **Strategies for a better bedtime at home**

Strategies to help the over responsive child to self-regulate and soothe at bedtime:

*Environment:* Bedtime should begin at least an hour before sleep. Have a routine that is followed nightly and supports self-regulation. Reading books, quiet play, low lighting, no screens and avoid giving any fruit juice or sugary treats or desserts (even high sugar fruits, like grapes and cherries could raise their blood sugar!).

*Clothing:* Allow the child to choose what feels comfortable to sleep in. If they need to sleep without clothes, let them sleep without clothes and keep the room comfortably warm. Children with tactile sensitivities often are overwhelmed by clothing. Pay attention to the fabrics they prefer and provide them choices for bedtime.

*Sheets and blankets:* Try different sheet fibers and tensions. An autistic child might prefer a weighted blanket over as standard blanket, or they may choose to use no blanket at all. There are even compression blankets made of lycra that fit over the mattress and provide deep joint compression while in bed. They are also useful in controlling excessive movement and falling out of bed without preventing all movement.<sup>13-15</sup>

In conclusion, therapeutic interventions may be helpful in ameliorating the many sequelae of poor sleep (the child and the family). It should also not be overlooked that autistic children are children, subject to the same social and emotional influences that disrupt the sleep of neurotypical children and the adults that caretake them. The issues are sometimes best addressed by working with the family unit as well as the autistic child.

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