

## **Qigong Sensory Training Therapy for Autism Spectrum Disorder**

### *An Evidence-Based Evaluation*

Use of Complementary and alternative medicine (CAM) therapies for autism spectrum disorder (ASD) in children is highly prevalent.

With the counseling of medical practitioners, CAM therapies are chosen by caregivers either as an alternative to conventional treatment, or in complement to conventional treatment to provide additional possible benefits for children with ASD.<sup>1</sup> A recent, large (N=1,084), geographically diverse survey found that 88% of parents used CAM therapies.<sup>2</sup>

Qigong sensory therapy (QST) is among a small handful of CAM therapies that show promising results with low risk of harm.

Other CAM therapies in this category include music therapy, yoga, qigong, energy therapies (e.g. reiki), supplements (such as melatonin, oxytocin, sulforaphane, vitamin C, Vitamin B12, folic acid, folic acid) therapeutic horseback riding and other types of animal/pet therapy, transcranial magnetic stimulation, and hypnotherapy; each of which may target specific or core ASD symptoms. Other CAM therapies exist but show unclear benefit or carry risk of harm.<sup>3</sup>

#### Advantages of Qigong sensory therapy

Qigong sensory therapy (QST) is a safe early intervention that caregivers can provide in home with a daily 15-minute sensory massage, supported by approximately 20 sessions with a therapist over a 1-2 year period. Care-giver delivered services can improve bonding and be empowering to families and pre-post data shows significant reduction in parent stress. Because the majority of care occurs in home by parents, QST overcomes identified System of Care barriers involving access to autism services such as professional workforce shortages and distance from clinics in rural areas. The infrastructure for these programs has already been developed and tested in multiple, randomized controlled trials with the support of the Maternal and Child Health Bureau, Health Resources and Services Administration, and Department of Health and Human Services (Grant R40 MC24945).<sup>4</sup> Results appear especially promising for improving ASD symptom severity and sensory challenges.<sup>5</sup>

#### Strength of Evidence for Qigong sensory therapy in Treatment of ASD in Children

In evaluating studies of ASD treatments in children, traditional metrics of bias may prevent meaningful interpretation of strength of evidence (SoE), due to emphasis on factors such as blinding, which may difficult or impossible to apply in this setting.<sup>3</sup> As such, agencies such as the Agency for Healthcare Research Quality (AHRQ) have developed ASD-specific bias evaluation methods.<sup>5</sup> For completeness, this review details the strengths and limitations of evidence for existing QST studies by both traditional and ASD-specific methods.

Since 2007, there have been four RCTs of Qigong sensory therapy in ASD for children<sup>6-10</sup>:

- (2007) A pilot RCT compared patients receiving QST and special education (N=8), vs. special education alone (N=7), and demonstrated improvement in sensory profile subscales (p=0.01–0.02) and some Vineland Adaptive Behavior subscales (daily living skills, p=0.02; and socialization, p=0.04).

- (2009) A follow-up RCT compared QST and special education (N=25), vs. special education alone (N=21), and showed improvements in Autism Behavior Checklist ( $p<0.01$ ), Pervasive Developmental Disorders Behavior Inventory (AWP/C, EXSCA/C subscales by teacher scoring; these and the sensory subscale by parent scoring;  $p<0.01$ ), and Sense and Systems Checklist ( $p<0.01$ ).
- (2011) A redesigned RCT compared QST treatment (N=24) vs. a waitlisted control group (N=18), showed improvements in Autism Composite Score ( $p<0.01$ ), Sensory and Self-Regulation Checklist ( $p<0.01$ ), Pervasive Developmental Disorders Behavior Inventory (AWP/C, REXSCA/C, and Sensory subscales;  $p<0.01$ ), as well as Parent Stress Index ( $p<0.01$ ). Improvements in Teacher Autism Behavior Checklist ( $p<0.01$ ) were scored by blinded teachers.
- (2015) A replication RCT compared QST treatment (N=42) vs. a waitlisted control group (N=42), showed improvements in receptive language behavior ( $p=0.03$ ), autistic behavior ( $p<0.01$ ), total sensory abnormalities ( $p<0.01$ ), tactile abnormalities ( $p<0.01$ ), and autism severity ( $p<0.01$ ) using blinded professional examiners. In addition, parents reported improved child-to-parent interactions, bonding, and decreased parenting stress ( $p<0.01$ ).

*RCT Study Design:* The major strength of these studies is the RCT study design, which can be difficult to achieve in studies of children with ASD. Initial (2007–2009) studies were criticized for lack of isolation of the treatment effect (i.e. special education was applied to both the treatment and control groups), though this was likely done since it appeared unethical to withhold any kind of treatment in a population where early intervention may be the most effective. However, later studies were redesigned to compare QST treatment with a waitlisted control group, which would seem to be an improved approach. During the RCT, parents agreed not to administer any other treatment or CAM treatment.

*Blinding, Parent Reported Outcomes, and Involvement:* Early studies drew concerns of bias by including only parent-reported outcomes. Due to the fact that treatment is parent-administered, complete two-way blinding would have been impossible; however, researchers incorporated one-way blinding where possible over time. The 2011 RCT added blinded teacher scoring of outcomes, and the 2013 RCT added blinded professional examiners to evaluate outcomes. Interestingly, one stated criticism in a 2011 systematic review was that patients in the treatment group may have received unmeasured home help from [unblinded] parents<sup>11</sup>, which although a limitation in scientific evaluation of the intervention as it is narrowly defined in the study, would likely be an asset to improving ASD in children in real world applications.

*Patient Population:* One limitation of overall generalizability of these RCTs was that the studies were not geographically diverse, since all were centered in Oregon state, and they were performed by a single research group.<sup>5</sup> In addition, QST RCT SoE scores have been penalized in systematic reviews because the related journal articles do not clearly state the study window or address participant overlap between studies. However, the clinical trial study dates and enrollment age (3-6) would logically preclude the possibility of overlap. The authors are set to confirm non-overlap and sample size in an upcoming retrospective review and meta-analysis.

Sample Size: Lastly, a small sample size has been noted in several reviews<sup>5,11</sup>, focused especially on the earlier studies and the lack of related power analyses. Although the largest study to date (2015; N=42 vs. N=42) did not include power analyses, the prior study (2011) contained adequate data to show that the follow-up replication study would be adequately powered to detect significant differences between treatment and control groups. However, *a priori* power analyses would be recommended in future studies.

Overall SoE Ratings: the most recent systematic review commissioned by AHRQ<sup>12</sup> rates the QST studies' positive attributes as:

- Consistency of results: Consistent (in the direction of improvement in ASD symptoms)
- Directness of measuring intended outcomes: Direct
- Reporting bias: Not detected

The main limitation in evidence was listed as “Precision of effect: imprecise” noting that the magnitude of the effect remains unclear. As future, larger studies are completed, probabilistic confidence intervals will continue to narrow to reveal a more precise magnitude of effect.

## References

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