

Promising Treatments for Autism Spectrum Disorder

Lirio Sobrevinas Covey, Ph.D.

February, 2013

Mikey, my second child, was diagnosed at the age of 3 with Pervasive Developmental Disorder. At the age of six, Mikey was given the specific diagnosis of Autism. From then on, I was always on the look-out for ways that Mikey's behavioral and neurological problems could be reversed or reduced.

In support groups for families and from the popular literature on autism, I heard about Auditory Integration Therapy, Facilitated Communication, and Hyperbaric Oxygen Therapy, among a number of complex and expensive treatments. I considered them, but was troubled by the scarcity of supportive evidence. Most of the reports were anecdotal tales from parents or teachers, not from large samples in controlled scientific studies. I was also cautioned by Mikey's neurologist at Albert Einstein Hospital in New York, Dr. Isabelle Rapin, not to act until more evidence was available.

A few years later, case studies or open-label trials with a few patients began appearing regarding possible benefits of drug treatments. Among them were the SSRIs (selective serotonin receptor inhibitors) that were already being used to treat psychiatric symptoms. More recently, gluten-free/casein-free diets received much attention and favorable reporting from some ASD doctors and patients. Thus, it was to my surprise and interest that, in a review article, a team of psychiatric investigators had assessed the relevant scientific evidence for the treatments I mentioned above as limited and unconvincing.

Thus far, the list of autism treatments for which supportive evidence has held up is limited. The short list includes combination treatment consisting of speech and language therapy, social skills training, and behavioral programming. Adaptive Behavior Therapy (ABT) has produced the best outcomes among single treatments. Also considered established treatments are two medications – risperidone and aripiprazole. Both medications are among the newer anti-psychotic drugs approved for patients with schizophrenia and bipolar disorder. These medications were approved by the US Federal Drug Administration (FDA) for the treatment of irritability and behavior problems (such as aggression, willful self-injury, temper tantrums) in children and adolescents with autism. Still, these medications must be used with great caution since they may produce undesirable side effects. FDA approval for adults with autism awaits the results of ongoing research.

Even the “established” treatments have not shown benefit for all patients and may have serious adverse effects. Thus, additive (or complementary) and alternative treatments have been tried. In their review article, the research team of Lofthouse and colleagues list and describe CATs that they recommend because they pass tests of effectiveness and safety, but withhold full recommendation for others because of only partial evidence of treatment efficacy and safe side effect profile.

Eighteen complementary and alternative treatment (CATs) are described in the review. Three treatments received a “recommended” rating because they meet the criteria of safety, evidence of effectiveness, and low cost (“cheap”). Eleven treatments received an “acceptable” rating -- they yielded some positive outcomes but inadequate side effect information. Four CATs are rated as “not acceptable at this time” - they are based on biomedical theory but favorable outcomes have not been observed.

The “recommended” CATs:

1. Melatonin – orally administered. Melatonin is a neurohormone released in response to decreasing levels of light. (Melatonin is used for reducing sleep difficulties associated with jet lag). Sleep difficulties are experienced by many persons with ASD. In five well-controlled trials melatonin improved sleep duration and time to sleep but did not change the number of nighttime awakenings. Side effects were minimal to none. The authors support melatonin treatment for persons with ASD who suffer from mid- and late insomnia.
2. Multivitamin/Mineral supplements – orally administered. Some biomarkers of nutritional status may correlate with autism severity in persons with ASD . Positive evidence from controlled trials has been observed, but boundaries of dose tolerance are unclear. This treatment is recommended for persons who may have restricted, unbalanced diets as a result of idiosyncratic or other types of eating problems.
3. Massage therapy. Manipulation of superficial layers of muscle and connective tissue can enhance bodily functioning, relaxation, and well-being. Single blind (but not the standard double-blind) trials have found improvements in total ASD symptoms, and problems in social relatedness, sleep, language, social communication, and receptive language, repetitive behaviors, sensory issues, disruptive behavior, and anxiety.

The “acceptable” CATs:

1. Vitamin B6 and magnesium. These are dietary supplements that presumably correct metabolic deficiency in persons with ASD. Improvements in social interactions, communication, and repetitive behaviors have been noted in multiple studies, but negative studies showing lack of benefit have been reported as well. Thus, the evidence is considered equivocal. When kept at daily doses below 1 gram for B6 and not over 200-300 grams for magnesium, these treatments are safe and could help because they may be compensating specific genetic abnormalities which resulted in ASD symptoms.
2. Folic Acid. A genetic variation influencing folic acid level was observed to double the risk of autism. An open trial of folic acid combined with Vitamin B12 given to children with ASD showed significant improvement in expressive and receptive language. This treatment has not been associated with adverse side effects. Limited evidence for efficacy has been reported. The authors suggest further trials and close monitoring for possible unexpected side effects.
3. Omega-3 Fatty Acids. These acids, known to produce benefits for cardiovascular health, ADHD, and mood disorders, are also known to benefit brain development. In some studies conducted with ASD children, hyperactivity, stereotypical behavior, and inappropriate speech improved.

The observed effects did not reach statistical significance, however, indicating the need for larger sample sizes and, possibly, only small to moderate effects of this treatment.

4. Probiotics and gastrointestinal (GI) medication. Probiotics are microorganisms thought to improve digestive health. Many persons with ASD also suffer GI disorders. Enzyme treatment and probiotics have been proposed to help reduce self-stimulation, stereotypies, aggression and hyperactivity, and to improve socialization and GI symptoms. Positive outcomes from a small number of studies, for example increased variety of food choices, warrant consideration of these treatments for individuals with ASD and GI symptoms.
5. Iron Supplementation. Low iron intake and low iron blood level have been reported in some children with ASD. Low iron level is associated with psychomotor retardation, poor sleep, and neurological behavioral problems, and with antipsychotic medications use in ASD children. An 8-week open trial found that iron level increased significantly in the study sample of ASD children; more evidence in well-controlled studies is warranted.
6. L-Carnosine. This chemical compound is a potential CAT for Autism because of its protective neurological effects. An 8-week double-blind trial with 31 children found significantly better results with the compound than with placebo on ratings for total autism symptoms, and in sub-scores for behavior, socialization, and communication. However, hyperactivity and excitability were observed.
7. Chelation. Chelation therapy removes heavy metals from the blood and is driven by the theory that ASD is caused by excessive build-up of heavy metals in the body. Positive evidence indicating improvement in language, cognition, and sociability, has been reported. However, unspecified “risks” have also been reported, most commonly, diarrhea and fatigue. This treatment for ASD remains controversial and is recommended only if heavy metal toxicity, seen in urine or blood, for example, is confirmed.
8. Acupuncture. Based in traditional Chinese medicine, acupuncture involves the systematic insertion and manipulation of thin needles into the body to improve health of body/mind by unblocking the flow of qi (“energy”). Results from controlled trials conducted with ASD children found improvements in attention, receptive language, self-care, language, overall functioning, and communication. Acupuncture was also well tolerated.
9. Exercise. This treatment may reduce hyperactive and repetitive behavior through the release of neurotransmitters such as acetylcholine or beta-endorphins. Several studies of antecedent aerobic exercise with ASD children produced decreased self-stimulation and repetitive behavior, and increased academic performance. Antecedent exercise is safe and cheap. If feasible for the child and setting, exercise may be helpful, particularly for those with significant repetitive behavior.
10. Music therapy. This treatment involves structured and unstructured individual and group sessions, may occur with or without a leader, and involves playing or listening to music. Trials conducted with ASD children have reported significant improvement in imitating signs and words, eye contact and turn-taking, nonverbal communication, emotional responsiveness, social engagement, and compliant behavior.
11. Animal-assisted therapy (AAT). The animal is seen as a transitional object for bonding before generalizing the attachment to people. Results in studies with ASD children included significant

improvement in playful mood, focus, awareness of social environment, use of language, social interaction, and motivation to interact with the environment. The research lacks controlled studies, including monitoring of adverse effects. AAT appears safe, but requires trained supervision, and may be expensive. Some positive but also some questionable benefits have been reported. The treatments may not be cheap and the side effect profiles remain to be known.

“Not recommended at this time”. These are treatments based on well-considered biological hypotheses related to ASD symptoms but available evidence does not pass acceptable levels of safety and effectiveness. These are: Vitamin C (to correct metabolic imbalances), cyproheptadine (an anti-histamine that corrects elevated serotonin level), immune therapies (for immune deficiencies), and neurofeedback (brain training towards self-regulation of EEG activity).

Comment. ASD symptoms are complex, varied, and inconsistently responsive to treatment. Even established treatments shown to benefit many can produce negative or adverse outcomes for others. In their 2012 review article, Lofthouse and colleagues give information on what treatments may be tried, to what extent, and to what level of monitoring, when established treatments are not effective. Importantly, such treatment decisions should be made in conjunction with the physician treating the patient with ASD.

This article contains notes and excerpts from “ A Review of Complementary and Alternative Treatments for Autism Spectrum Disorder” by Lofthouse N, Hendren R, Hurt E, Arnold LE, Butter E. Published in “Autism Research and Treatment”, 2012, Article ID 870391.

Lirio Sobrevinas Covey, Ph.D. is President of the Association for Adults with Autism, Philippines. www.adultautismphil.wordpress.com. She is Professor of Clinical Psychology in Psychiatry at the Columbia University Medical Center and a Research Scientist with the New York State Psychiatric Institute. E-mail address: liriocovey@gmail.com or lsc3@columbia.edu