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## ORIGINAL ARTICLE

**EFFICACY OF WATERMELON PROCEDURE ON AN "ALPHA" SETTING IN AVAZZIA PRO-SPORT™ DEVICE TO HAVE A CALMING EFFECT ON THE AUTISTIC CHILDREN - A PILOT STUDY**

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### ABSTRACT

**Objectives:** Given the severe and chronic problems associated with Autism Spectrum Disorders (ASD) and the limitations of available treatments for hyperactivity, impulsivity and inattention, there exists a large public health need for additional interventions. In Avazzia BEST™ (Bio-Electric Stimulation Technology) device, one of the modes has "alpha waves" frequency (7-12 Hz). The beginning of relaxation occurs during this wave length. **Materials and methods:** In the study, 4 special school children age 5-12 years with autism were selected. They were given watermelon procedure on an "Alpha" setting (in Pro-Sport™) once daily for a period of 6 weeks. Hyperactivity/impulsivity subscale of the Conner's Parent/Teachers Ratings Scale and ATEC were used prior to beginning of treatment and at the end of six-week period. **Results:** After 6 weeks of treatment, the children showed no statistically significant improvements in target symptoms, but mild improvement was noted in their ATEC scores. Parents and teachers both reported mild improvements in restlessness and impulsivity, emotional liability, and hyperactivity. **Conclusion:** The children with autism have many problems, so parents and teachers feel that any small improvement is worth it. With a small improvement, they are more manageable in the classroom, and able to benefit from other psychosocial and educational interventions.

**Keywords:** Autism, Alpha Waves, Pro-Sport™, Hyperactivity

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## INTRODUCTION

**About Autism:** Autism spectrum disorder (ASD) is characterized by: Persistent deficits in social communication and social interaction across multiple contexts; Restricted, repetitive patterns of behavior, interests, or activities; Symptoms must be present in the early developmental period (typically recognized in the first two years of life); and, Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning<sup>1,2,3</sup>.

The term "spectrum" refers to the wide range of symptoms, skills, and levels of impairment or disability that children with ASD can have. Some children are mildly impaired by their symptoms, while others are severely disabled.

Attention Deficit Hyperactivity Disorder (ADHD) is a condition that makes a person inattentive, impulsive and hyperactive. An increasing number of children are diagnosed as having both ADHD and autism, and many parents are understandably confused about the links between the two.

DSM-IV stipulates that a diagnosis of ADHD can only be made if the child has shown signs of the condition before the age of seven and has been experiencing symptoms of inattention, impulsivity or hyperactivity to an extent which is developmentally deviant and for a period of at least six months<sup>4</sup>.

ADHD is not a core symptom of ASD, but "it is a common co-morbid condition and can be a significant source of disability for patients living with ASD," said Robert Ring, PhD, vice president of translational research for Autism Speaks.

The actual diagnosis that your child has received is irrelevant here. Some children with autism will also display hyperactive behaviors and some children with ADHD will demonstrate autism traits. As a result, they will need behavioral and other interventions that recognize this combination of needs<sup>5</sup>.

**Management of Autism:** Given the severe and chronic problems associated with Autism Spectrum Disorders (ASD) and the limitations of available treatments, there exists a large public health need for additional interventions. As more parents are inquiring about complementary and alternative treatments (CATs), both parents and practitioners require up-to-date information about them and whether and how to integrate them into treatment<sup>6,7</sup>.

Many treatments have been proposed for Autism Spectrum Disorders (ASD). No medications are currently established to treat ASD core symptoms. "Off-label" medications are often prescribed for co-occurring behaviors such as inattention, impulsivity/hyperactivity, sleep problems, repetitive/preservative behaviors, anxiety, mood, agitation, aggression, and disruptive and self-injurious behaviors but may have significant side effects. Survey research has estimated the utilization of psychotropic medication for youth with ASD as high as 47%, but there is ongoing debate about the role of such agents. Response rates to medication for co morbid diagnoses in children with ASD may be lower than for children without ASD<sup>8</sup>.

**Avazzia Pro-Sport™:** Avazzia Inc. was founded in January 2004 and incorporated in Texas in May 2004. Avazzia designs, manufactures,

markets and distributes scientifically advanced, US Food and Drug Administration (FDA) accepted devices in the fields of microcurrent electro-medicine and bio electric stimulation technology, utilizing its patent pending BEST™ technology.

Avazzia devices uses state-of-the art micro-current interactive feedback and electro-stimulation technology to gently stimulate the body's natural resources to resolve pain, not just mask it. The Bio Electric Stimulation Technology (B.E.S.T™) handheld devices are easy-to-use for non-pharmaceutical pain relief, as well as an incredible tool for pain management.

BEST™ (Bio Electric Stimulation Technology) devices produce unique microcurrent impulses transmitted through the skin to interface with the internal peripheral nervous system for therapeutic intervention. The BEST™ micro-current output stimulation is a train of high-voltage, pulsed-current, damped, sinusoidal and asymmetrical pulses. BEST™ devices react to the body's response to the micro current stimulus.

With each response, the electrical properties of the tissue change. These changes in the tissue characteristics result in changes in the output.

The device detects changes and indicates relative tissue reaction responses in a cybernetic feedback loop. BEST™ products are controlled by a high-performance microcomputer chip, which uses Avazzia proprietary software. Pro-Sport™ and BEST™ are trademarks of Avazzia Inc. USA.

**Reasons for using Avazzia Pro-Sport™ for the study:** One of the modes in Avazzia device,

FM7-12, produces frequency modulated output patterns from 7 to 12 Hz as well as modulating damping features.

This mode was selected because the output range of frequencies is similar to the rate of brain wave oscillations with a frequency of 9 to 13Hz known as "alpha waves".

Alpha waves are brain waves between 7.5 Hz and 13 Hz that peak around 10 Hz. The beginning of relaxation occurs during this wave length. The graph of the alpha state shows high frequency, low amplitude brain waves. During alpha awareness the mind is relaxed and alert. It is a state of passive awareness, composure, and of physical and mental relaxation. Emotional sensations in the alpha state include a sense of wellbeing, pleasure and tranquility. Alpha state appears to bridge the conscious to the subconscious<sup>9</sup>.

Alpha state brainwaves are slower than beta (our active state). It is a state of "aware relaxation" and it brings numerous advantages: It improves your mental processes concentration, clarity of thinking, decision making, memory; Calms your body and mind while it maintains alertness; Stimulates imagination, intuition and higher awareness<sup>10,11</sup>.

## MATERIALS & METHOD:

In the study, 4 special school children with autism were selected ranging in age from 5 years to 12 years. They were given watermelon procedure on an "Alpha" setting (in Pro-Sport™) & 3 pathways on the spine and the 6-point therapy on the trigeminal nerves on the face, once daily for a period of 6 weeks.

Subjects were instructed to apply the “Alpha” settings via Pro-Sport™ preset mode FM7-12Hz in a watermelon pattern on the scalp and 3-pathways pattern on the back and 6-point trigeminal nerves therapy on the face, once daily for a period of 6 weeks.

A combination of standardized and novel outcome tools was used to measure the efficacy of the treatment. Hyperactivity/impulsivity subscale of the Conner’s’ Parent/Teachers Ratings Scale and ATEC were used. Parents/teachers/caregivers filled out the Autistic Treatment Evaluation Checklist (ATEC) and Conner’s’ Parent/Teachers Ratings Scale prior to beginning of treatment and at the end of six-week period<sup>12</sup>.

## RESULT

Out of 4 children 1 child dropped out due to non-compliance. Their ATEC score pre and post treatment are as follows:

Name of the child	ATEC Score (pre-treatment)	ATEC Score (post-treatment)
AJ	62	55
AK	48	48
UK	76	73

### Range of scores

ATEC scores range from zero to 180. The lower the score, the better the child is. If a child scores zero or close to zero, that child can no longer be distinguished from non-autistic children and thus can be considered fully recovered. The important benchmarks in scoring are as follows:

**ATEC<30:** This level places the child in the top 10 percentile. A child with score of less than 30 or, better still, less than 20 would have some ability to conduct normal, two-way conversations, and more or less behave normally. Such children have high chances of leading normal lives as independent individuals.

**ATEC<50:** This places the child in the 30th percentile level. The child has good chances of being semi-independent. More importantly, he or she will not likely need to be placed in an institution or “nut house”. For many parents of autistic children, being able to achieve improvement up to this level is already considered very significant.

**ATEC>104:** Even though the maximum score is 180, any person with a score of more than 104 would already be in the 90th percentile, and be considered very severely autistic.

The range of scores, and their percentile levels, is shown in the table below:

Percentile	ATEC score
<b>mild autism</b> 0 – 9	0 – 30
10 – 19	31 – 41
20 – 29	42 – 50
30 – 39	51 – 57
40 – 49	58 – 64
50 – 59	65 – 71
60 – 69	72 – 79
70 – 79	80 – 89
80 – 89	90 – 103
90 – 100 <b>severe autism</b>	104 – 180

As the table shows, the scores are not evenly spread. Thus, the number of improvement points is not as vital as what the final score is. For example, a moderately autistic child who improves by 40 points, from 45 to 5, would be far better off than a severely autistic child who improves by, say, 100 points from 180 to 80.

After 6 weeks of treatment, the children showed no statistically significant improvements in target symptoms of 'hyperactivity', 'impulsivity', 'inattention', 'oppositionality', 'aggression' and 'intermittent explosive rage'. But mild improvement was noted in their ATEC scores. Parents and teachers both reported mild improvements in restlessness and impulsivity, emotional liability, and hyperactivity.

The children have many problems, so parents and teachers feel that any small improvement is promising. With a small improvement, they are more manageable in the classroom, and able to benefit from other psychosocial and educational interventions. Parents, but not teachers, also noted changes in oppositional behavior and cognitive problems.

## CONCLUSION

Study presented here support that children with autism and ADHD can respond well to the unique output waveforms output in the specific frequency modulation range 7-12Hz applied in specific patterns on the head, back and face. Although randomized controlled trials with large sample size is needed for future study, systems that allow therapists to continue rigorous and consistent monitoring for many years have a valuable role to play. Furthermore, such monitoring systems which now exist

electronically can easily accumulate large data sets and reveal details about long-term effectiveness and long-term side effects of stimulation that are unlikely to be discovered in short-term trials.

Further analysis of the double-blind data is needed, but the results of the open-label phase are encouraging. Study is needed to replicate these findings and to see whether they could be generalized to the everyday clinical setting.

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