Nano Therapy: A Step Toward Reversing Autism Symptoms

Dr.Arun Inbaraj[1], Mr.Naveenprasanth[2], Mr.Murali.M[3],Mr.Ashok.G[4]
J.N.N Institute of Engineering
aruni@jnn.edu.in,naveenprasanthv@jnn.edu.in,ac@jnn.edu.in ,ashokg@jnn.edu.in

Abstract

The broad syndrome is an impairment of neurological and environmental disorders which together develops into an incurable disease that stands as an autism spectrum disorder (ASD). It is characterised by repetitive behavioural patterns and a lack of cognition. It is caused due to chains of biological and psychosomatic aspects which occur in toddler life, but realization or symptoms are delayed. Hence, the abnormalities hamper the afterbirth, especially during neuron development, brain growth, immune system, and inflammatory reactions. The universal incidence of autism is just lower than 1%, nevertheless, the estimations are sophisticated in economically advanced countries. Currently, the evidence says that the biological factors of autism spectrum disorder are analysed from genetics, brain development, and other aspects. There has been a recent concern in finding therapies for autism. We have attempted to reverse autism by employing nanotechnology.

Key words: Autism Spectrum disorder,Immune system.

Introduction

Autism Spectrum Disorder is regarded as by variances in communication and social interface. Individuals with autism spectrum disorder (ASD) repeatedly demonstrate constrained and tiresome interests or outlines of conduct[1]. ASD is observed in folks around the world, irrespective of race and civilization, culture, economic background, caste, creed, or colour. The Centres for Disease Control and Prevention (CDC) fathomed that ASD is identified in boys than in girls in a ratio of 4:1 (Boys: Girls) and 77 % in identical twins[1].

The term autism was coined by Eugen Bleuer in 1908. A recent study analysed the DNA of more than 35584 people worldwide including 11986 autistic individuals, the researchers discovered variations in 102 genes associated with a higher risk of developing ASD. Additionally, 53 genes were shown to be largely linked to autism and not to other developmental disorders, according to researchers[2][3].

Types

The following are the major classifications of autism[4]

i. Asperger's Syndrome: In this type, the individuals can speak and talk freely but are socially non-cognitive.
ii. Autistic Disorder: Neither communicates socially nor plays actively which can be seen in children younger than 3 years.
iii. Childhood disintegrative disorder: Very distinctive growth for minimum 2 years and gradually mislays their presenting and social skills.
iv. Pervasive developmental disorder: Individuals can socialize and communicate easily but in a delayed manner.
v. Rett Syndrome: Psychomotor regression with loss of volitional hand use of spoken language, the development of repetitive hand, stereotypes and gait impairment.

Treatments

Play therapy is a pronounced treatment which can help patients with autism. It includes playing with them, joint attention symbolic play engagement and regulation (JASPER), and integrated play groups (IPGs). Occupational therapy helps patients perform daily tasks with ease and promote physical wellness[5]. Other therapies such as speech therapy and applied behavioural analysis (ABA) are also reported to be effective and

improve the quality of life in autism patients. Different types of ABA are useful for the treatment and management of autism. These all are aimed to improve behaviour and skills. Speech therapy is a type of therapy that aimed to improve overall communication skills. It can help autistic patients to articulate interaction and develop communication[6]. Therapeutic Horse Riding (hippotherapy) is a type of physical therapy which is reported to help children of 5 to 16 age to articulate and develop social skills. The alternative remedies available for autism include vitamins, chelation therapy, and hyperbaric oxygen therapy, where Vitamin D inhibits the synthesis and biological actions of pro-inflammatory prostaglandins, which are elevated in autism and in a recent study showed that daily intake of vitamin D supplements showed decreased in core symptoms associated with autism, and chelation therapy a method to remove excess heavy metals in the human body[7]. The idea of using chelation as a tool for treating autism grew out of a belief that mercury-containing thimerosal (a preservative) in vaccines was the direct cause of a rapid increase in autism spectrum diagnoses. In one human study, 12 autistic children were treated with HBOT at 1.3 atm/24% oxygen, while another group of six children received HBOT at 1.5 atm/100% oxygen[8]. The researchers measured biomarkers for inflammation in the brain before and after the therapy sessions. Results showed that in both groups, HBOT significantly reduced cerebral inflammation and improved behaviour[8]. Non-verbal autism patients can learn through technology-based augmentative communication systems for the development of social, behavioural, and speech skills. Compulsive behavioural therapy (CBT) is a type of therapy which is proven efficient in the management and control of anxiety in autism patients.

Autism therapy is one of the least evaluated areas in the case of treatment and management. A recent review identified that only less than 41 social studies on adults have been published so far from 1980 to 2017. Furthermore, a systematic review in 2012 noted also identified only 32 treatment studies published from 1980 to 2010. This provided evidence that considerable interest and attention should be given to the reinforcement and recalibration of autism therapies[9].

Xueqin He and his team performed and evaluated an innovative approach for autism that a nanoparticle system that encapsulated aspirin (an anti-inflammatory drug) enhanced social skill and behaviours in ASD mice [10]. Their nanoparticle system successfully crossed the blood-brain barrier (BBB) and inhibited microglial cell activation. Overall, it resulted in a safe and enhanced anti-inflammatory effect of aspirin in neurons. This clearly shows that nanoparticle systems are a safe and efficacious strategy for the treatment of ASD and other neurodevelopmental disorders[10].

Materials and Methods

This is a novel approach to treat autism with the supply of nano energy through a skull cap impregnated with nanoparticles, emitting energy around a zeta potential of 28.8 mV. The energy distribution must be equal in all areas of the cap. Also, we found that, with increase in number of nanoparticles the biological effect drops, so study of cephalometry and electron microscopy to determine the distribution curve.

Figure 1: Nano Cap

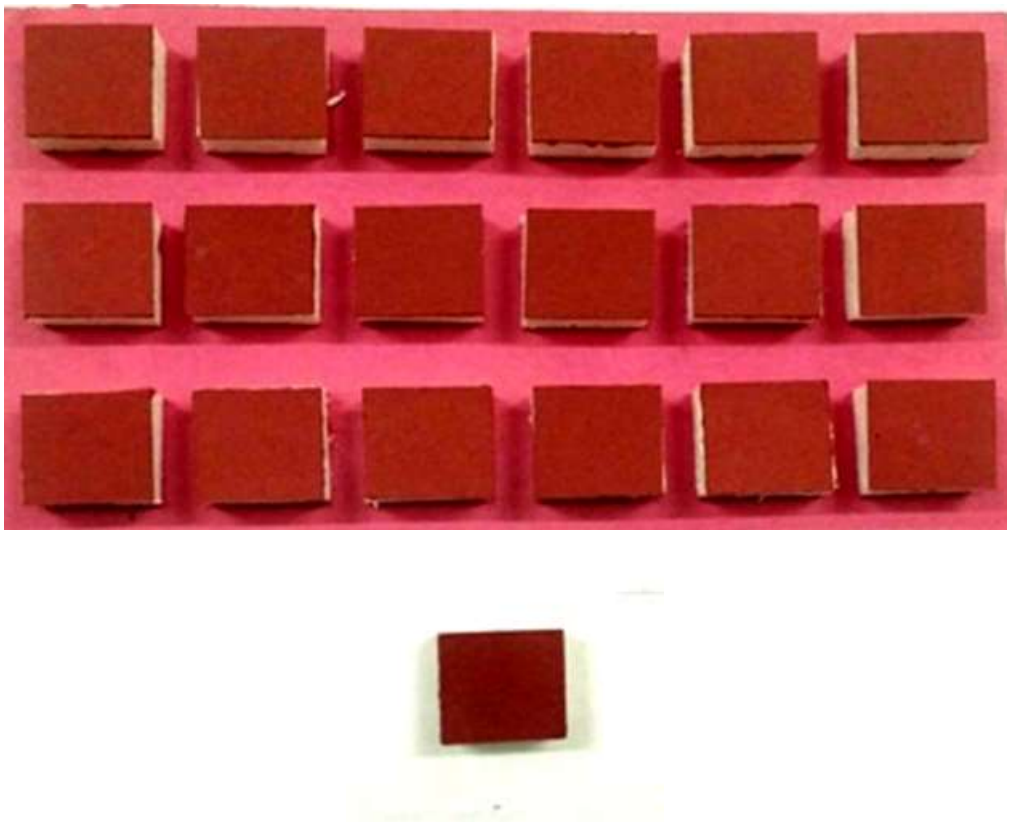

Figure 2. Physical model of Nanoparticles cubes deposited at intervals between each other on the uncovered base.

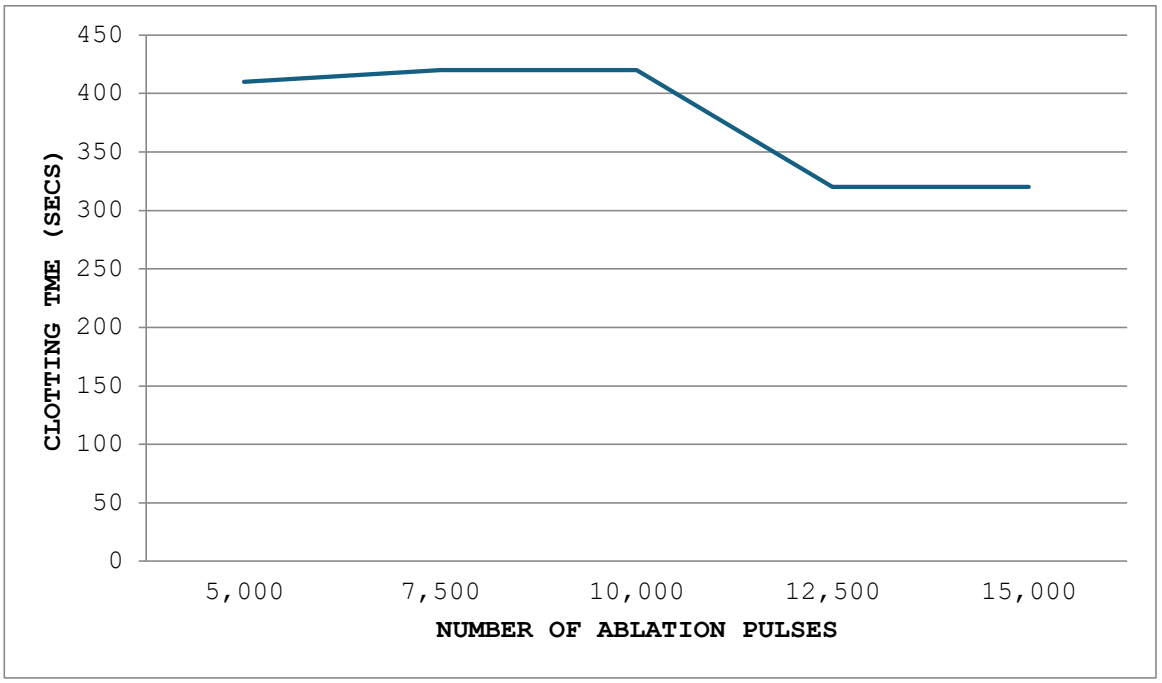

Figure 3. Representation of Anti-coagulation effect of Copper Nanoparticles deposited Pyrolytic carbon.

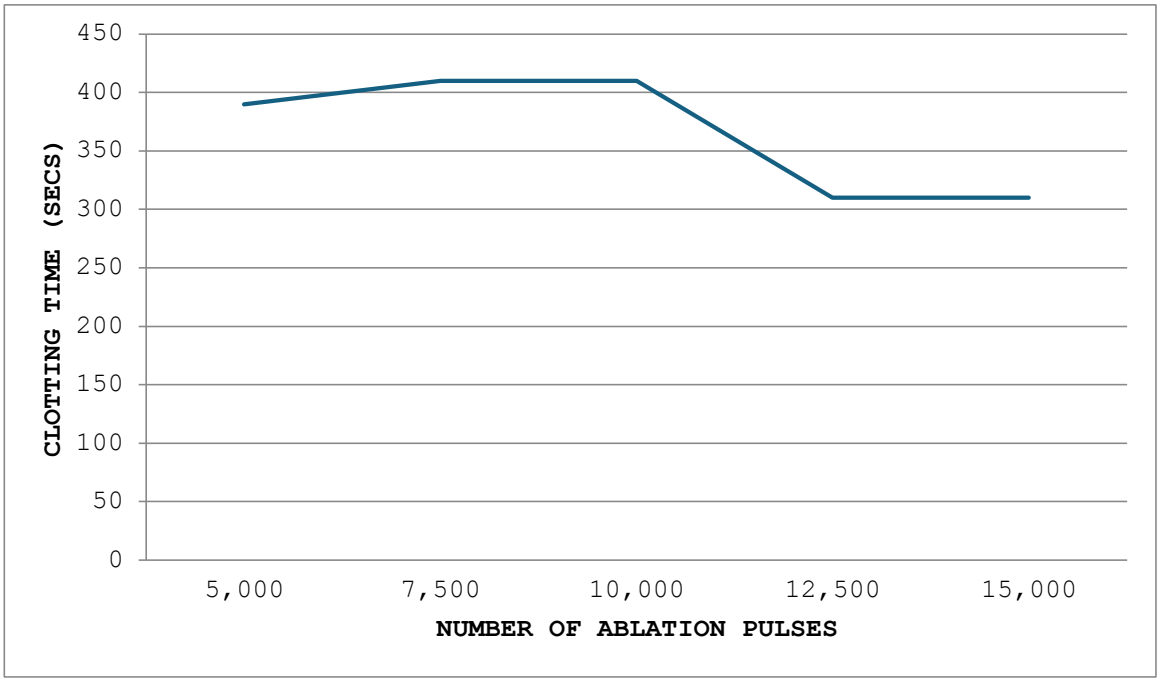

Figure 4. Representation of Anti-coagulation effect of Silver Nanoparticles deposited Pyrolytic carbon.

The material for Nano autism cap, in which the nanoparticles must be incorporated is preferably cotton, which has an even surface area. Synthetic fabrics and metallic parts should be avoided. The energy of the coated Nano particles declines at a nonlinear rate and to increase the longevity, the cap should be sealed in a wooden box when not in use. The Micro electricity charged in Nano cap has a life span of about three months, then it has to be replaced with fresh energy loaded caps or should be coated again with nanoparticles.

Discussion

In our attempt to reverse autism, based on, level of micro electricity in the brain of autistic children, we found that metallic nanoparticle carries a certain amount of positive micro electricity. This observed from our previous work, where normal breast shows less energy output and less electricity when compared to malignant neo plastic breast lesions. On assessing autistic individuals, we observed the nano potential of -27mv whereas normal brain has zeta potential of +38.6 mv so, we selected a suitable material to make the nano particle to negate the energy. We coated the nano particle on cotton skull cap; after assessing the distribution of nano particle in the Nano Autism Cap with cephalometric analysis, we have applied this cap to autistic individual preferably 24 hrs except during bath. Some of the individuals complained of excessive sweating, nobody complained headache or any associated symptoms.

Our first patient in this trial has a history delayed speech, not maintaining eye contact, not communicating verbally with parents at the age of 4, necessary investigations were done and reported normal MRI of brain, normal gait but diagnosed as delayed speech with autism by paediatrician.

In this first case, we found, within three months of wearing the nano cap, the autistic movements totally disappeared, and the autistic individual showed interest in his environment. After recovery, he started washing clothes in household on his own, from this we found the individual is aware of his surrounding and environment. Since he showed reversal of symptoms, we have enrolled the individual in speech therapy and occupational therapy for further rehabilitation.

Result

From our speculations, we noticed, the Nano energy is effective and promising in reversing the conditions associated with autism spectrum disorder. Currently, a greater number of individuals are being inducted in this program. The WHO president stated that 25% of world population could be autistic by 2050, so it could be grave problem like global environmental threats, everyone must contribute to save humanity from extinction. So, we contribute by offering our finding to the whole world.

Conclusion

Even though there are more research implementation in this area arises still now there is no comprising solution to cure the autism. Incurable condition will reverse in this technique. Further we can eradicate this condition and save the Autistic children's life. Larger series on this will confirm the efficacy which we are trying to do in association with neurologists.

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