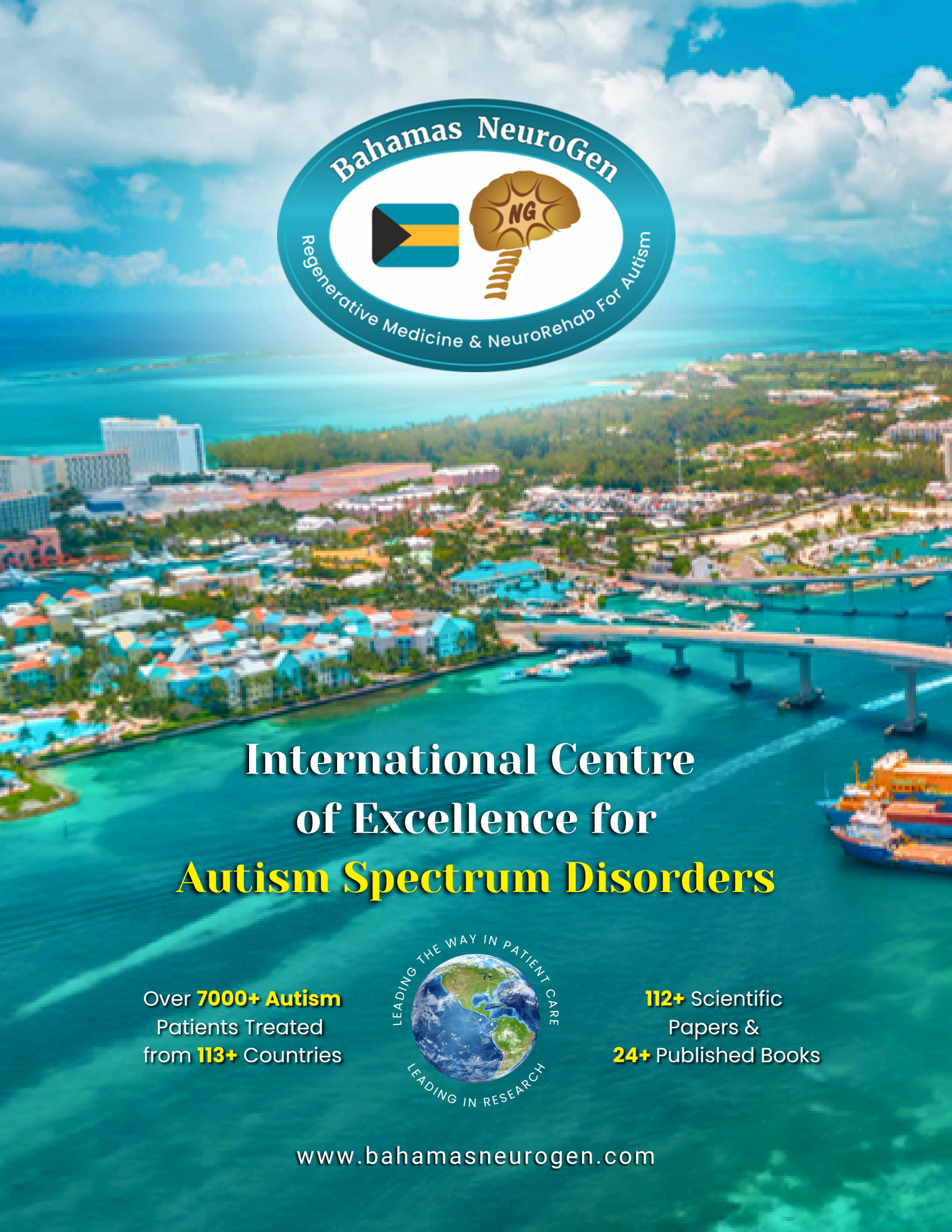

Bahamas NeuroGen
NG
Regenerative Medicine & NeuroRehab For Autism
International Centre
of Excellence for
Autism Spectrum Disorders
Over 7000+ Autism
Patients Treated
from 113+ Countries
LEADING THE WAY IN PATIENT CARE
LEADING IN RESEARCH
112+ Scientific
Papers &
24+ Published Books
www.bahamasneurogen.com

International Achievements

USA

"Doctor Julius Wayne Dudey Award"
by The Socio Economic Development Foundation of Boston Inc. USA
at **Boston, USA**
(May 2022)

"Inspirational Company"
by World Confederation of Business at St Thomas,
Virgin Islands, USA
(July 2017)

Europe

"The Rose of Paracelsus Award"
by European Medical Association (EMA) and Socrates Nomination Committee
Cannes, France
(October 2016)

"European Award of Best Practices"
by European Society of Quality Research
at **Brussels, Belgium**
(May 2018)

UK

"Nelson Mandela Leadership Award"
Oxford, UK
(September 2023)

"Bharat Gaurav Award"
Given at the British Parliament
By the **British Member** of **Parliament Virendra Sharma**
London, UK
(July 2019)

Asia

"Sino-Phil Asia Peace Award"
by the Sino-Phil Asia International Peace Awards Foundation Inc.
Manilla, Phillippines
(January 2023)

"Swasthya Bharat Samman 2024 Award"
by Union Minister of Health & Family Welfare and Chemicals & Fertilizers **Shri J.P. Nadda** and Minister of State for Health and Family Welfare of India **Smt. Anupriya Patel**
(September 2024)

About Bahamas NeuroGen

Bahamas NeuroGen Comprehensive Clinical Care Centre for Autism is located in the heart of Nassau on New Providence Island. Our facility is designed to be a sanctuary of healing, perfectly positioned to provide both clinical excellence and the tranquil beauty of the Caribbean.

Proximity & Connectivity

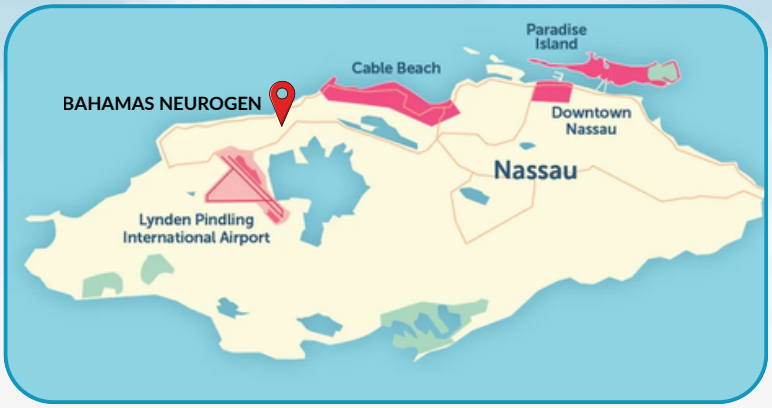
We understand that for our international families, ease of travel is a top priority.

Our location offers unparalleled accessibility:

International Gateway: Located just a short 20 minute drive from Lynden Pindling International Airport (NAS), the primary hub for the Bahamas with direct daily flights from major North American and European cities.

Elite Accommodations: We are situated within closed proximity to the famous Cable Beach and other 5-star resorts and hotels, including Grand Hyatt Baha Mar, Atlantis Paradise Island, and the British Colonial, offering world-class hospitality for our patients and their families.

Premier Amenities: The centre is adjacent to high-end shopping complexes, international pharmacies, and diverse dining options, ensuring all your daily needs are met within a small radius.



Accommodation & Infrastructure

Patient Service Desk

Once you reach Bahamas NeuroGen, our Patient Service team will help you with scheduling appointment with our doctors.

Appointments for all the pre operative tests will also be managed by us. (MRI, EEG, PET SCAN, Blood test etc).

Accommodations

We offer two types of accommodations keeping in mind their convenience.

Deluxe Room - 32
Service includes: Single AC Room with ensuite bathroom, which can accommodate child and two parents TV, Refrigerator, Electric kettle Microwave & Free Wi-Fi.

Suite Room - 2
Service includes: 2 AC rooms (Patient room & Living room) with ensuite bathroom, which can accommodate child and two parents, with sibling TV, Refrigerator, Electric kettle Microwave & Free Wi-Fi.

Facilities at Bahamas NeuroGen

Medical and Surgical Departments

- Operation Theater
- Cell Laboratory
- Diagnostic Center

Operation Theater

Neurorehabilitation Therapies

- Cognitive Behaviour Analysis and Psychological Intervention
- Aquatic Therapy
- Occupational Therapy
- Sensory Integration
- Speech Therapy
- Special Education
- Physiotherapy
- Art Based Therapy

Cell Laboratory

Neurorehabilitation

Integrative Therapies

- HBOT
- Ozone Therapy
- Gut Cleansing
- Micronutrients Supplements
- Diet & Nutrition

HBOT

Aquatic Therapy

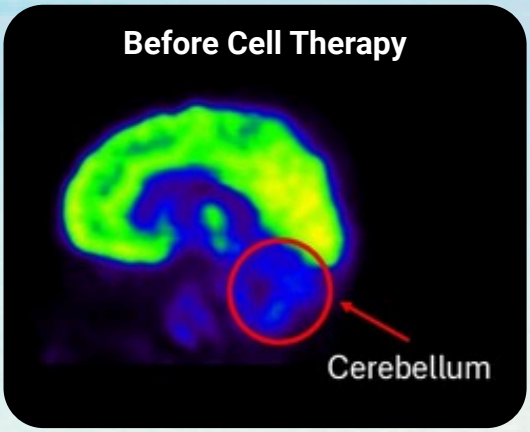
Advanced Brain Imaging

Advanced Brain Imaging - PET CT Brain

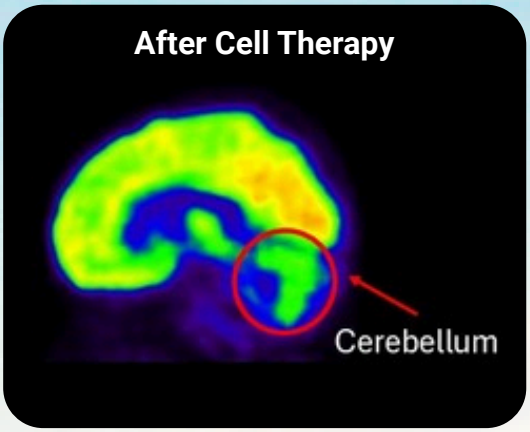
Specialized brain imaging PET-CT of the brain (Positron Emission Tomography - Computed tomography) is used to see the functional deficits and imbalances in the brain. These brain scans show in colour which parts of the brain are functioning less and which parts are functioning more.

In the Brain PET-CT scan, blue areas indicate low function, while green and yellow areas represent good function.

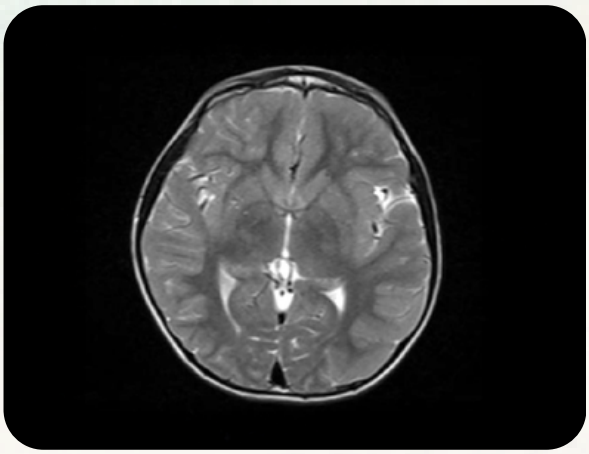
A. Brain PET-CT scan before cell therapy in an autism patient showing hypometabolism (low function) in the cerebellum, thalamus, and mesial temporal regions.



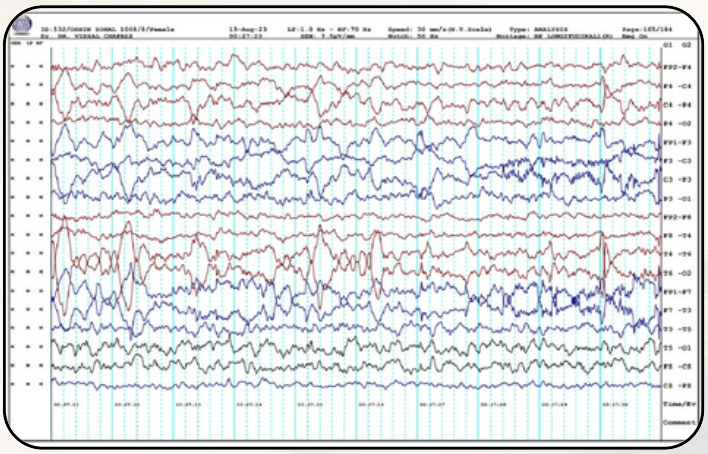
B. Brain PET-CT scan after cell therapy showing restored metabolic activity (improved function) in these regions.



Routine Investigations



MRI Brain



EEG

Our Team

At Bahamas NeuroGen, our multidisciplinary team of experienced doctors, therapists, and medical professionals is dedicated to delivering advanced regenerative treatments with compassion and expertise. Guided by global research and patient-centered care, we work together to help individuals with neurological conditions achieve their fullest potential.

Medical Director

Dr Teykia Deveaux, *Pediatrician, MD, DABP, FAAP*

Teykia Deveaux, MD, A graduate of Howard University College of Medicine, she pursued an internship at Nagoya Daiichi Red Cross Hospital in Nagoya, Japan, before completing a pediatric residency at Peyton Manning Children's Hospital in Indianapolis, Indiana. She is Board Certified by the American Board of Pediatrics as well as the National Board of Physicians and Surgeons.

Medical Consultants

Dr Alok Sharma, *Neurosurgeon, MS, MCh*

Dr Alok Sharma is a neurosurgeon and neuroscientist who is presently the Director of the NeuroGen Brain and Spine Institute in Navi Mumbai, India. He is also the former Professor and Head of Department of Neurosurgery at the LTM Medical college. He is the current President of the International Association of Neurorestoratology and President of the Society of Regenerative Sciences (SRS) India.

Dr Hemangi Sane, *MD (USA)*

Dr Hemangi Sane is a trained physician with an MD in Internal Medicine from New York Medical College, USA. She is one of the leading physicians of the world and is committed towards finding treatment for neurological disorders through research. Along with her interest in medicine and academics, she is a deeply devoted socialist and runs her foundation "Asha Ek Hope" for patients diagnosed with ALS/MND.

Dr Nandini Gokulchandran, *MD*

Dr Nandini Gokulchandran has worked for several years with the esteemed Tata Institute of Fundamental Research (TIFR) where she worked on Stem Cells, brain development and Neuroregeneration. She brings to NeuroGen an astute amalgamation of medical / clinical backgrounds with deep faith and understanding of research in Regenerative Medicine.

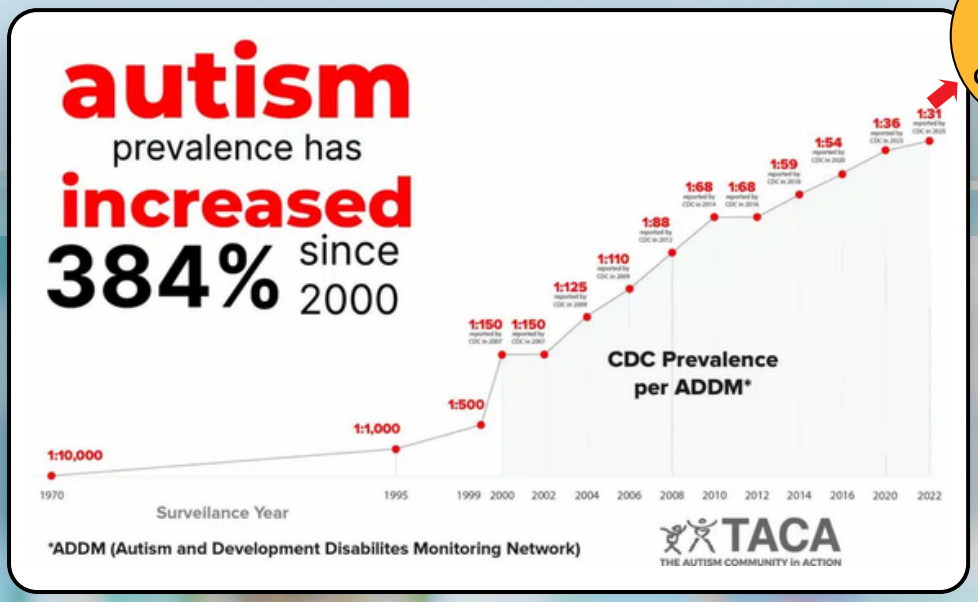
Dr Prerna Badhe, *MD*

Dr Prerna Badhe is a Consultant Neuropathologist & has authored several research papers and most of her work has been published in journals of international repute. Trained at the National Institute of Health, NIH, Baltimore, John Hopkins, USA, in Neural Cells and at the Kentucky Spinal Cord and Injury Research Centre, KSCIRC, USA, in Molecular Neurobiology and Neuroregeneration, she set up the Cell Centre at the L.T.M. Medical college & L.T.M. General Hospital, Sion, Mumbai.

Autism

Autism is a neurodevelopmental disorder characterized by impaired social interaction, verbal and non-verbal communication, and restricted and repetitive behavior. Parents usually notice signs in the first two years of their child's life. These signs often develop gradually, though some children with autism reach their developmental milestones at a normal pace and then regress.

According to the current estimates from the Centers for Disease Control and Prevention (CDC) Autism and Developmental Disabilities Monitoring (ADDM) Network, about 1 in 31 children in the USA are on the Autism Spectrum.



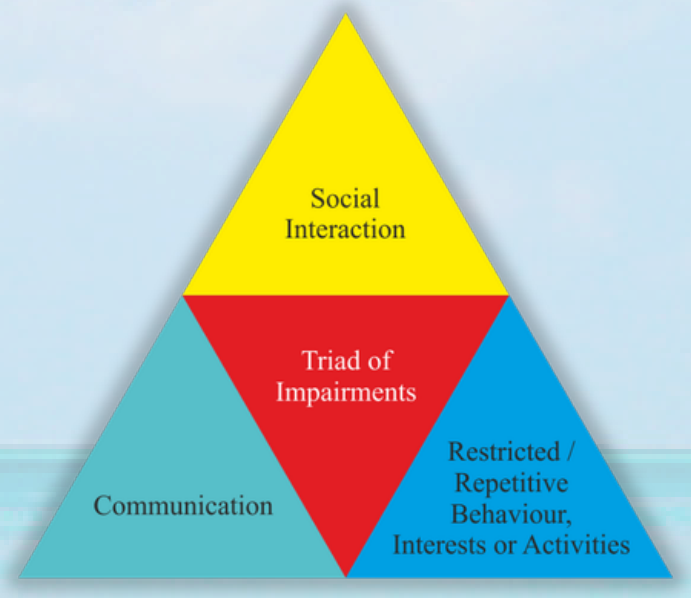
1:31
reported by
CDC in 2025

Graph from the CDC website showing increase in Autism prevalence

About Autism

What are the clinical symptoms of Autism?

The main problems in Autism are depicted in the triad below

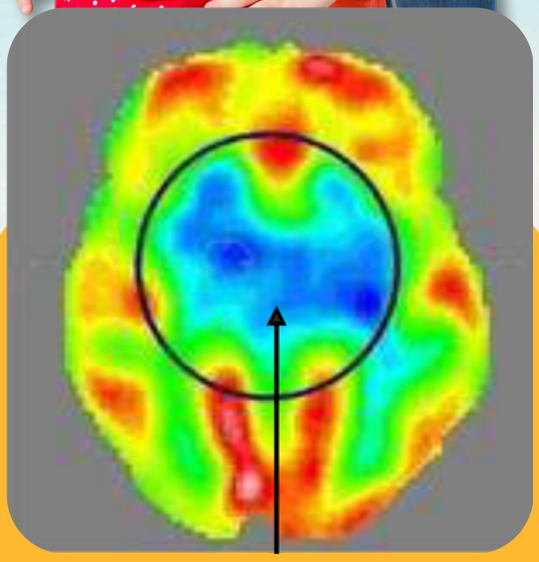


What is the fundamental problem in the brain that results in Autism?

Dysfunction in any of the below areas is responsible for problems seen in autism:

- Mesial temporal lobe (the innermost part of the brain) - learning, understanding, memory, social interaction, and abstract thinking issues.
- Thalamus - sensory issues.
- Cerebellum - balance, coordination, muscle tone, and speech issues.

This information, about the functioning of brain areas is obtained from PET-CT and MRI scan of the brain. These imaging studies allow to study the abnormal pattern of cortical activation in autism. These studies indicate that reduced blood flow to certain areas of the brain could lead to reduced functioning of those areas.



PET CT scan of the brain in child with autism shows blue area that represents reduced brain activity due to the damage that occurs to the brain tissue in autism.

Comprehensive and Special Neurorehabilitation

All of us are aware that Neuroehabilitation plays an important role in the journey towards empowerment and development for children with Autism, Cerebral Palsy and other neurodevelopmental disorders. Whereas most special needs children get some form of rehabilitation, what is being realised is the need for 'Comprehensive Rehabilitation' where therapists from different branches work together in an integrated and comprehensive manner.

Integrative Therapy

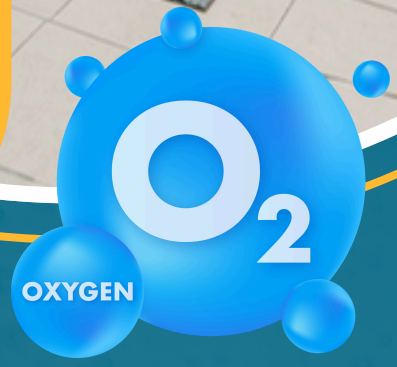
Hyperbaric Oxygen Therapy For Autism

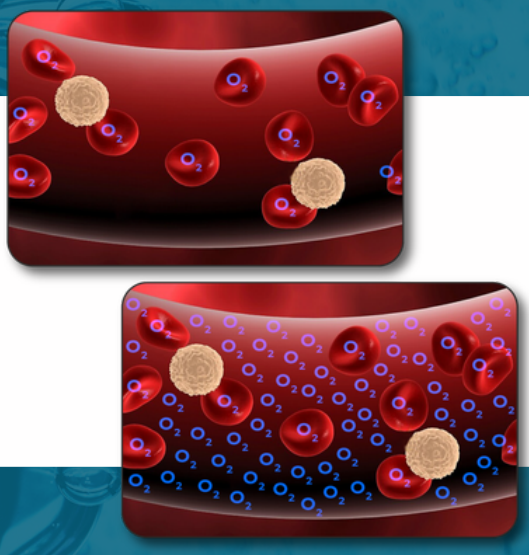
How Does HBOT Work?
Under normal conditions, we breathe air at 1 atmospheric pressure (1 ATA). In this state, oxygen is primarily transported throughout the body by the hemoglobin in our red blood cells.

During an HBOT session, the process changes in two powerful ways:

Increased Pressure: You relax in a specialized, transparent chamber pressurized to levels higher than sea level (1.5–2 ATA).

Oxygen Saturation: The increased atmospheric pressure forces oxygen to dissolve directly into your blood plasma, not just your red blood cells.





Administration of hyperbaric oxygen therapy leads to new blood vessel formation, and neuronal recovery in children with autism. These new blood vessels are able to carry blood more efficiently into the hypoxic areas of the autistic brain – flooding it with oxygen which also helps in improving brain metabolism and reducing inflammation in the damaged areas of the brain of autistic children.

Integrative Therapy

Ozone Therapy For Autism

How It Works: The Science of Cellular Respiration
Ozone therapy works by increasing the oxygen-carrying capacity of the blood. When introduced to the body, it:

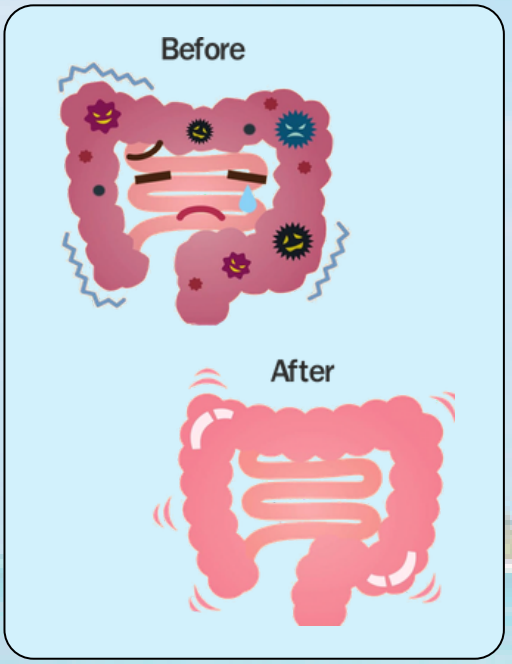
- **Stimulates Antioxidants:** It triggers the body's own antioxidant response, which is crucial for reducing oxidative stress in children with autism.
- **Wakes Up "Hypoxic" Brain Regions:** Certain areas of the brain in autistic children may be under-functioning due to poor oxygenation. Ozone helps deliver vital oxygen to these "hypoxic" zones.
- **Acts as a Natural Germicide:** Ozone is a potent tool against hidden viral, bacterial, fungal, and parasitic infections that often tax the immune systems of children on the spectrum.

While the oxygen we breathe is O2, Ozone (O3) is a "supercharged" or activated form of oxygen. In a clinical setting, Medical Grade Ozone Therapy uses a precise blend—typically 95% oxygen and 5% ozone-to jumpstart the body's natural healing mechanisms.

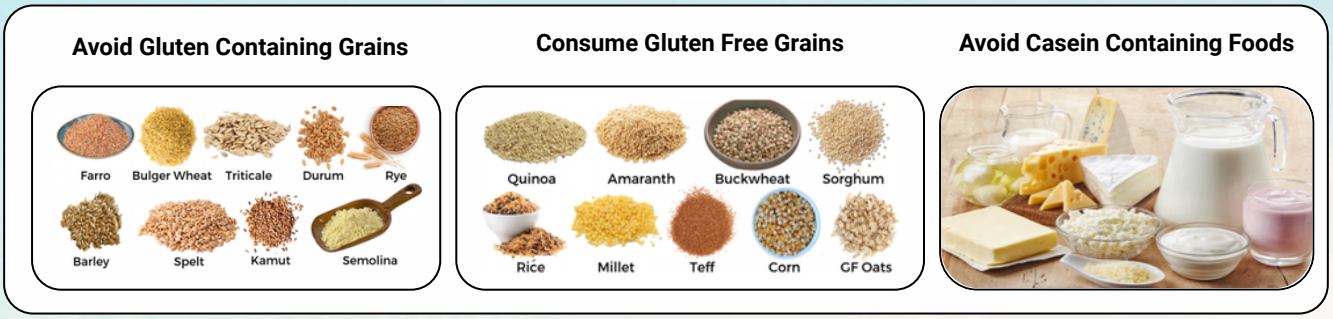
Integrative Therapy

Gut Cleansing for Autism

The gut microbiota has been found to affect brain function through the neuroendocrine signaling, neuroimmune signaling, and bacterial metabolites. The recent finding of the microbiota-gut-brain axis indicates the bidirectional connection between our gut and brain. The gut microbiota can be evaluated by a simple fecal test known as gut microbiome test. Gut cleansing is done with the help of oil enema and per rectal ozone therapy and supplemented with the right diet and probiotics suggested in the results of gut microbiome test.



Diet for Autism



Micronutrients Supplements

- Magnesium
- Calcium
- Zinc
- Vitamin B complex
- Vitamin C
- Vitamin A
- Vitamin D
- Vitamin K
- Omega-3
- Glutathione
- N-acetyl cysteine
- Vitamin B6 (Pyridoxine)
- Omega 3
- Dimethylglycine (DMG)
- Prebiotic (Inulin , oligosaccharides)
- Others

Two Treatment Packages are Available

6 Days Program

DAY 1-2 — Wednesday & Thursday

Clinical, Biochemical & Neuroimaging workup

- Admission and detailed evaluation.
- Neurological and functional assessment by medical and rehabilitation team.
- Blood and Special investigations such as Brain MRI, PET-CT scan, EEG etc.

DAY 3 — Friday

Cell Therapy

- Aspiration of bone marrow from pelvic bone.
- Separation of cells from bone marrow.
- Injection into the spinal fluid.

DAY 4-6 — Saturday - Tuesday

Neurorehabilitation

- Applied Behaviour Analysis
- Aquatic Therapy
- Occupational Therapy
- Sensory Integration
- Speech Therapy
- Special Education
- Physiotherapy
- Art Based Therapy

Integrative Therapy

- HBOT
- Ozone Therapy
- Gut Cleansing
- Micronutrients Supplements
- Diet & Nutrition

12 Days Program

DAY 1-2 — Wednesday & Thursday

Clinical, Biochemical & Neuroimaging workup

- Admission and detailed evaluation.
- Neurological and functional assessment by medical and rehabilitation team.
- Blood and Special investigations such as Brain MRI, PET-CT scan, EEG etc.

DAY 3 — Friday

Cell Therapy

- Aspiration of bone marrow from pelvic bone.
- Separation of cells from bone marrow.
- Injection into the spinal fluid.

DAY 4-12 — Saturday - 2nd Tuesday

Extended Neurorehabilitation

- Applied Behaviour Analysis
- Aquatic Therapy
- Occupational Therapy
- Sensory Integration
- Speech Therapy
- Special Education
- Physiotherapy
- Art Based Therapy

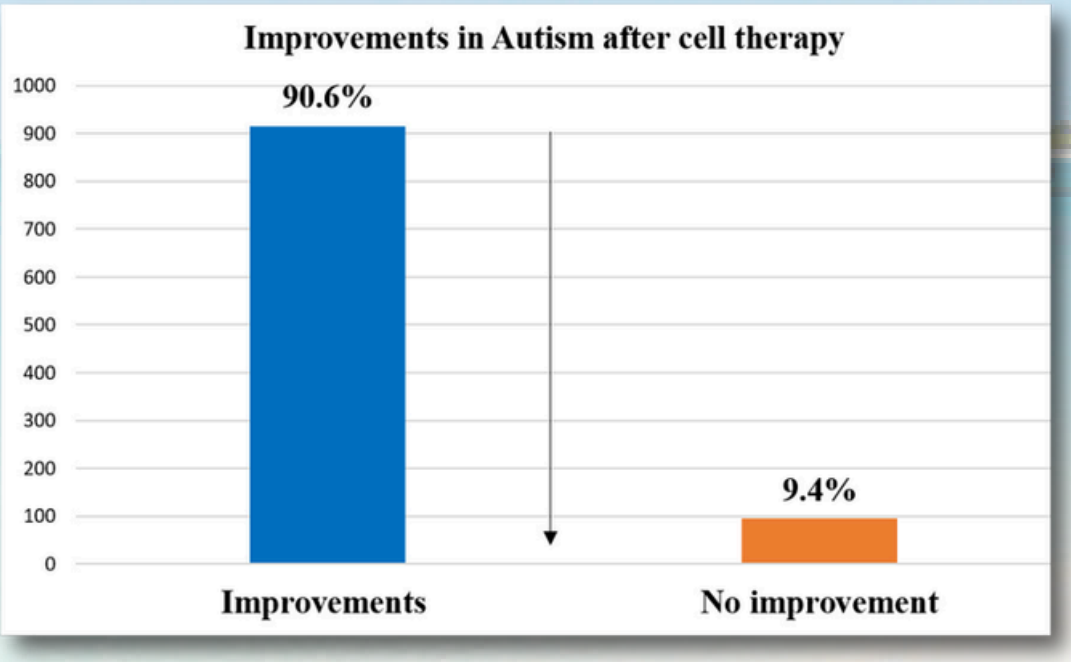
Extended Integrative Therapy

- HBOT
- Ozone Therapy
- Gut Cleansing
- Micronutrients Supplements
- Diet & Nutrition

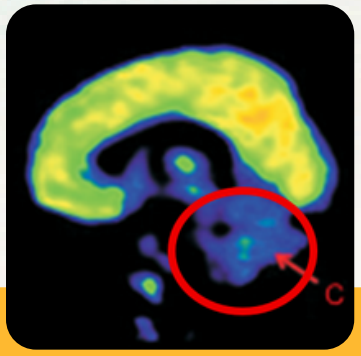
Improvements

Improvement after Cell Therapy in Autism

After cell therapy in children with autism, overall improvement is observed in 90.6% of cases. Notable clinical benefits include enhanced attention and concentration, improved response to commands, better eye contact, increased sitting tolerance, and more meaningful interaction with others. A reduction in hyperactivity is commonly seen, along with improvements in communication and speech. Additionally, there is a decrease in stereotypical behavior, as well as reduced aggressive and self-injurious tendencies. These clinical improvements are further supported by objective changes observed in brain imaging, including PET-CT scans.

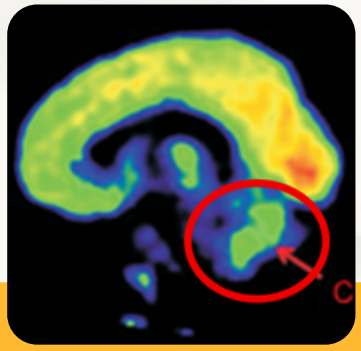


Before Cell Therapy



Brain PET CT scan showing reduced metabolism indicated in the red circle in the cerebellum (C) in patient with Autism.

After Cell Therapy



PET CT scan showing improved metabolism indicated in the red circle in the cerebellum (C) in the patient after cell therapy.

Treatment Protocol

The procedure for Autologous Bone Marrow Cell Transplantation is minimally invasive with extremely simple steps. However, it can be a highly effective treatment option for individuals and may offer patients a chance for a recovery or long-term remission. One of the significant advantages of using autologous BMMNCs is that they are derived from the patient's body, reducing the risk of rejection or adverse immune reactions.

The Procedure is carried out in only 3 steps:

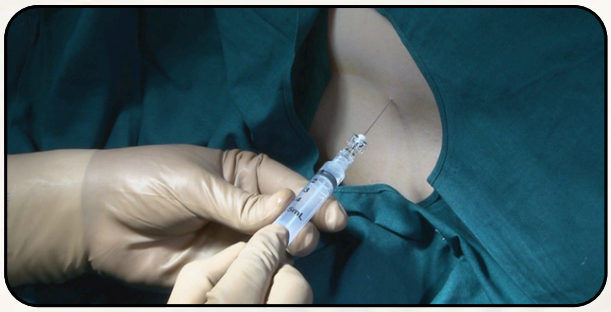
Bone Marrow Aspiration

In this procedure, a small amount of bone marrow is removed from the pelvic bone. This is done through a bone marrow aspiration needle, which is inserted into the pelvic bone. The procedure is usually done under local anesthesia. The entire time taken to do this is only 15 minutes. Bone marrow is aspirated based on the weight of the patient. The patient is sent back to the room to rest for the next step of the procedure.

Separation of Mononuclear Cells

On the same day, the mononuclear cells are separated and purified in the Cell Laboratory by using a procedure referred to as density gradient centrifugation within a few hours.

Cell Injection



Once cells are separated and purified, patient is taken back to the operation theatre. The cells are injected into the cerebrospinal fluid (the fluid that circulates around the spinal cord and brain) using a thin spinal needle. This is called as Intrathecal injection via a lumbar puncture.

Publications by NeuroGen on Cell Therapy in Autism

World's 1st Published Clinical Paper on Cell Therapy in Autism

1. Sharma A, Gokulchandran N, Sane H, Kulkarni P, Kannan K, Shaikh Z, Biju H, Paranjape A, D'sa M, Badhe P. **Autologous bone marrow mononuclear cell administration in a large cohort of 1011 autism spectrum disorder patients.** Clinical Transplantation and Research.
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3. Sharma A, Gokulchandran N, Sane H, Kulkarni P, Nivins S, Maheshwari M, Badhe P. **Therapeutic Effects of Cellular Therapy in a Case of Adult Autism Spectrum of Disorder.** International Biological and Biomedical Journal. 2018 Mar 15;4(2):98-103.
4. Alok Sharma, Nandini Gokulchandran, Pooja Kulkarni, Sarita Kalburgi, Shruti Kamat, Riddhima Sharma, Samson Nivins, Hemangi Sane, Prerna Badhe. **"Improvements in a case of autism spectrum disorder after cell therapy as noted on PET CT brain scan"** SJSC. 2017; 1(2):1-7.
5. Sharma A, Gokulchandran N , Sane H, Kulkarni P, Pai S. **A Case of Autism Showing Clinical Improvements after Cellular Therapy along with PET CT Evidence.** J Stem Cell Res Ther. 2017;2(4):00070.
6. Alok Sharma, Hemangi Sane, Nandini Gokulchandran, Prerna Badhe, Pooja Kulkarni and Suhasini Pai. **Stem Cell Therapy in Autism Spectrum Disorders.** Recent Advances in Autism SMGroup. 2017
7. Sharma A, Sane H, Gokulchandran N, Badhe P, Patil A, Kulkarni P, Paranjape A. **PET-CT scan shows decreased severity of autism after autologous cellular therapy: a case report.** Autism Open Access. 2016;6(2);1-6.
8. Sharma A, Gokulchandran N, Sane H, Patil A, Shetty A, Biju H, Kulkarni P, Badhe P. **Amelioration of autism by autologous bone marrow mononuclear cells and neurorehabilitation: A case report.** American Journal of Medical Case Reports. 2015;3(10):304-9.
9. Sharma A, Gokulchandran N, Sane H, Bhovad P, Biju H, Shetty A, Kali M, Badhe P. **Cell therapy effects portrayed on positron emission tomography of the brain serve as a new dimension for autism.** Journal of Pediatric Neurology. 2014 Sep;12(03):151-6.
10. Sharma A, Gokulchandran N, Shetty A, Kulkarni P, Sane H, Badhe P. **Neuropsychiatric Disorder Tackled by Innovative Cell Therapy-A Case Report in Autism.** J Stem Cell Res Transplant. 2014;1(1): 4.
11. Sharma A, Gokulchandran N, Sane H, Kulkarni P, Thomas N, Paranjape A, Badhe P. **Intrathecal autologous bone marrow mononuclear cell transplantation in a case of adult autism.** Autism. 2013 Sep;3(2):113.
12. Sharma A, Gokulchandran N, Shetty A, Sane H, Kulkarni P, Badhe P. **Autologous bone marrow mononuclear cells may be explored as a novel potential therapeutic option for autism.** J Clin Case Rep. 2013 May;3(282):2.
13. Sharma A, Badhe P, Gokulchandran N, Kulkarni P, Mishra P, Shetty A, Sane H. **An improved case of autism as revealed by PET CT scan in patients transplanted with Autologous bone marrow derived mononuclear cells.** J Stem Cell Res Ther. 2013 May;3(139):2.
14. Sharma A, Gokulchandran N, Sane H, Nagrajan A, Paranjape A, Kulkarni P, Shetty A, Mishra P, Kali M, Biju H, Badhe P. **Autologous bone marrow mononuclear cell therapy for autism: an open label proof of concept study.** Stem cells international. 2013;2013. Article ID 623875, 13 pages.
15. Sharma A, Chopra G, Gokulchandran N, Lohia M, Kulkarni P. **Autologous Bone Marrow-derived Mononuclear Transplantation in Rett Syndrome.** Asian Journal of Paediatric Practice. 2011;15(1).

Landmark papers by NeuroGen on Cell Therapy in Autism

Hindawi Publishing Corporation
Stem Cells International
Volume 2013, Article ID 623075, 13 pages
http://dx.doi.org/10.1155/2013/623075

Hindawi

Clinical Study

Autologous Bone Marrow Mononuclear Cell Therapy for Autism: An Open Label Proof of Concept Study

Alok Sharma,[1] Nandini Gokulchandran,[1] Hemangi Sane,[2] Anjana Nagrajan,[3] Amruta Paranjape,[3] Pooja Kulkarni,[2] Akshata Shetty,[3] Priti Mishra,[3] Mrudula Kali,[3] Hema Biju,[3] and Prerna Badhe[3]

[1] *Department of Medical Services and Clinical Research, NeuroGen Brain and Spine Institute, Surana Sethia Hospital and Research Centre, Sion Trombay Road, Chembur, Mumbai 400071, India*
[2] *Department of Research & Development, NeuroGen Brain and Spine Institute, Surana Sethia Hospital and Research Centre, Sion Trombay Road, Chembur, Mumbai 400071, India*
[3] *Department of NeuroRehabilitation, NeuroGen Brain and Spine Institute, Surana Sethia Hospital and Research Centre, Sion-Trombay Road, Chembur, Mumbai 400071, India*

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Academic Editor: Chen Lin

Cellular therapy is an emerging therapeutic modality with a great potential for the treatment of autism. Recent findings show that the major underlying pathogenetic mechanisms of autism are hypoperfusion and immune alterations in the brain. So conceptually, cellular therapy which facilitates counteractive processes of improving perfusion by angiogenesis and balancing inflammation by immune regulation would exhibit beneficial clinical effects in patients with autism. This is an open label proof of concept study of autologous bone marrow mononuclear cells (BMMNCs) intrathecal transplantation in 32 patients with autism followed by multidisciplinary therapies. All patients were followed up for 26 months (mean 12.7). Outcome measures used were ISAA, CGI, and FIM/Wee-FIM scales. Positron Emission Tomography-Computed Tomography (PET-CT) scan recorded objective changes. Out of 32 patients, a total of 29 (91%) patients improved on total ISAA scores and 20 patients (62%) showed decreased severity on CGI-I. The difference between pre- and postscores was statistically significant ($P < 0.001$) on Wilcoxon matched-pairs signed rank test. On CGI-II 96% of patients showed global improvement. The efficacy was measured on CGI-III efficacy index. Few adverse events including seizures in three patients were controlled with medications. The encouraging results of this leading clinical study provide future directions for application of cellular therapy in autism.

World's 1st Paper on Cell Therapy in Autism published in 2013

Am J Stem Cells 2020;9(5):89-100
www.AJSC.us /ISSN:2160-4150/AJSC0103655

Original Article

Cell transplantation as a novel therapeutic strategy for autism spectrum disorders: a clinical study

Alok K Sharma[1], Nandini Gokulchandran[1], Pooja P Kulkarni[2], Hemangi M Sane[2], Ridhima Sharma[3], Alitta Jose[2], Prerna B Badhe[4]

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Abstract: Background: Autism spectrum disorders [ASD] is a lifelong disability mainly affecting the development, communication, social interaction and behavior of an individual. Cell transplantation is emerging as a potential therapeutic strategy for ASD. Our previously published proof of concept study showed beneficial effects of cell transplantation in ASD. This study shows effect of cell transplantation in a larger sample size of ASD patients. Methods: 254 patients diagnosed with ASD on DSM V criteria were enrolled in this open label non-randomized study. The intervention included intrathecal transplantation of autologous bone marrow mononuclear cells and neurorehabilitation. On mean follow up of 7.50 months, percentage analysis was performed on all symptomatic changes. Changes in outcome measures, Indian Scale for Assessment of Autism [ISAA] and Childhood Autism Rating Scale [CARS], were analyzed statistically using Wilcoxon Signed-Rank Test. Comparative analysis of Positron Emission Tomography [PET CT] scan brain, performed before and 6 months after intervention, was done in 86 patients to monitor the outcome at cellular level. Change in the standardized uptake values was statistically evaluated using T-Test [P≤0.05]. Results: Improvements were observed in eye contact, attention and concentration, hyperactivity, sitting tolerance, social interaction, stereotypical behavior, aggressiveness, communication, speech, command following and self-stimulatory behavior. Statistically significant improvement was observed in scores of ISAA and CARS after intervention. A significantly better outcome of the intervention was found in patients at younger age and with shorter duration of disease [<5 years from time of diagnosis]. 86 patients who underwent a repeat PET CT scan showed improved brain metabolism after intervention in areas which correlated to the symptomatic changes. No major procedure related adverse events were recorded. However, 5 patients, with history of seizure and abnormal EEG, had an episode of seizure which was managed using medications. Outcome of intervention in these patients was not affected by seizures as improvements were observed in them. Conclusion: The results of this study indicate that autologous bone marrow mononuclear cells in combination with neurorehabilitation are a safe and effective treatment modality for ASD. It improves the quality of life of patients and helps them to integrate in mainstream lifestyle.

Keywords: Autologous, bone marrow mononuclear cells, autism spectrum disorders, PET CT scan, cell transplantation

Paper published in "American Journal of Stem Cells" in 2020

Publications

World's Largest Study From NeuroGen Showing Benefits Of Autologous Bone Marrow Mononuclear Cells In 1011 Children With Autism

Original Article

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Autologous bone marrow mononuclear cell administration in a large cohort of 1,011 patients with autism spectrum disorder: a retrospective observational study

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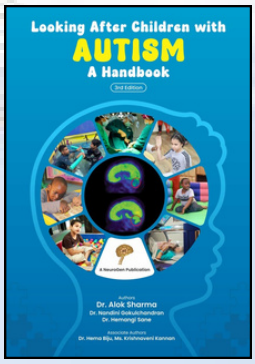
Background: This retrospective observational study analyzed the therapeutic efficacy of autologous bone marrow mononuclear cells (BMMNCs) in a large cohort of patients with autism spectrum disorder (ASD).
Methods: Overall, 1,011 patients with ASD who received intrathecal administration of autologous BMMNCs were included. Changes in symptoms and outcome measures—the Indian Scale of Autism Assessment (ISAA) and Childhood Autism Rating Scale (CARS)—were recorded. Brain positron emission tomography computed tomography (PET/CT) was used to objectively assess changes in brain metabolism.
Results: At a mean follow-up of 19.3 months, 90.6% of patients showed improvement after cell therapy. Symptomatic improvements were observed in attention and concentration, command following, eye contact, sitting tolerance, social interaction, hyperactivity, communication, speech, stereotypical behavior, aggressiveness, and self-injurious behavior. Patients who received multiple doses of cell therapy demonstrated better outcomes, and improvements were seen across all age groups and regardless of disease severity. Changes in ISAA and CARS scores were statistically significant ($P<0.05$). Comparative PET/CT scans of 401 patients revealed improved metabolism in the amygdala, hippocampus, parahippocampal gyrus, caudate nucleus, cerebellum, mesial temporal lobe, thalamus, and superior and middle temporal poles, which corresponded to symptomatic improvements. No major adverse events were reported. Nine of the 1,011 patients experienced seizures, four of whom had a prior history. These events were managed with medication, with improvements still observed in the nine patients.
Conclusions: Intrathecal transplantation of autologous BMMNCs, combined with neurorehabilitation, yields positive outcomes for patients with ASD. This approach helps reduce the degree of impairment and improves quality of life.

Keywords: Autism spectrum disorder; Bone marrow; Mononuclear cells; Positron emission tomography computed tomography; Cell therapy

91% of patients improved.

Comparison of pre- and post-therapy PET-CT scans in 401 patients demonstrated improved metabolic activity in multiple brain regions which correlated with the observed clinical improvements.

Books Published by NeuroGen on Autism



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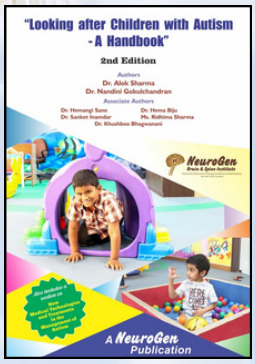

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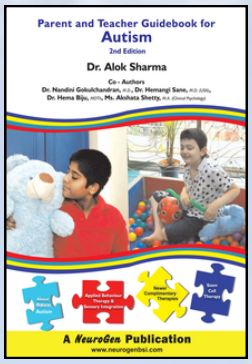

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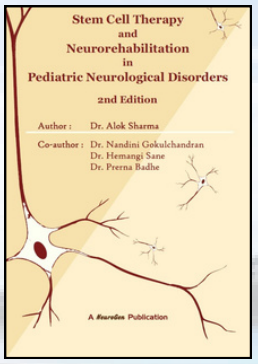

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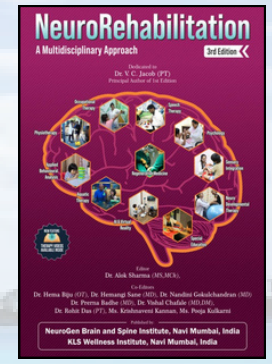

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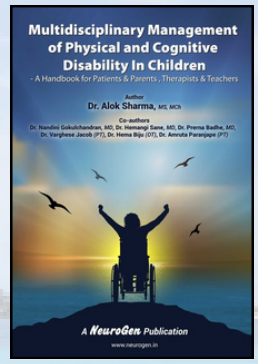

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