# SIGNIFICANT CLINICAL IMPROVEMENT OF SEVERE AUTISM SPECTRUM DISORDER SYMPTOMS FOLLOWING MESENCHYMAL STROMAL CELL TREATMENTS: CASE REPORT

**BACKGROUND** Autism spectrum disorder (ASD) is associated with significant lifelong challenges for severely affected children and their families. Despite the rise in the prevalence of ASD and the flurry of research being conducted to improve diagnostics and therapeutics, currently no highly effective therapeutic options exist. Studies have linked hallmark ASD traits with dysfunctional innate and adaptive immune responses. There has been anecdotal reporting of the positive impact of mesenchymal stem cell therapies (MSCT) in children with ASD. This presentation describes the effect of treatment of a 5-year-old boy with MSCT over the course of 4 years.

#### **CASE PRESENTATION**

Boy with severe ASD, epilepsy, and a pathological electroencephalogram (EEG) who underwent five MSCTs with cells from allogeneic placenta and umbilical cord tissue of unrelated donors, between the ages of 5.75 years and 9 years



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- and social anxiety.
- Crohn's disease and bipolar disorder
- typically developing sister
- Mother: Hypothyroidism during pregnancy, treated with eltroxin
- No other complications
- **Delivery:** Full-term

#### Child

- Severe reflux with daily vomiting and heartburn, and poor weight gain.
- Allergic reactions to mosquito bites.
- year
- Karyotyping: Duplication on chromosome 4q16.3
- Sequencing: Variations in SLC13A5 and CACNA1H genes. Fragile X ruled out.
- Typical development until age 18 months
- communication, oblivious to surroundings
- 0
- BID)
- Cannabidiol oil (7 drops, TID)
- Clonazepam (4 drops)
- Occupational therapy
- Communication therapy

#### **TREATMENT SCHEDULE**



placenta-derived (PD)

## Benjamin Gesundheit and Leah Hochbaum Cell El Ltd., Jerusalem, Israel

• Father: Hypothyroidism, ADHD, asthma, learning difficulties. Family history of hypothyroidism, ASD

• Mother: ADHD, asthma, learning difficulties. Family history of learning difficulties, ADHD, ASD,

• Siblings: infant brother with epilepsy and typical early signs of autism, brother with ASD and

• From age 19 months: tonic-clinic seizures; hospitalized with uncontrolled seizures 8 times in one

• At 18 months, gradual loss of acquired verbal and communication skills. • At diagnosis: poor coordination, tiring after walking ~50 m, tremor, dyskinesia, minimal

• Anticonvulsants – valproate, later switched to carbazepine (150 mg, BID), levetriracetam (500 mg







### CONCLUSIONS

initiation of

interaction

nappies

conversation

Social interest and

Weaned off bottles and

The child with severe ASD, intractable seizures, and gastrointestinal symptoms showed continuous positive clinical responses to five alloMSCTs over a 4 year period. Improvements included reduced classical features of autistic behavior, resolution of seizures and gastrointestinal symptoms, improved social skills and emotional expression and normalization of pathological EEG.

surroundings

• Expanded vocabulary,

spontaneous sentences

(short and structured)

Allogeneic MSCT might offer an attractive innovative modality for some children with ASD. It may also prove a promising therapy for children with seizure disorders.

Inventing game



	1 Month After Tx 4	6 Month After Tx 5
eelings ation ory h ew s	<ul> <li>Reduced anxiety and hyperactivity</li> <li>Expanded vocabulary, longer sentences, improved pronunciation</li> <li>Increased communication, engagement with friends</li> <li>Less aggressive and more attentive</li> <li>Improved expression of feelings, including nonverbal communication</li> <li>Increased independence</li> <li>Improved understanding of complex instructions</li> </ul>	<ul> <li>Significant cognitive improvement – faster and more crystalized thinking</li> <li>More mature and rational decision making</li> <li>Improved expression of emotional and physical needs</li> <li>Increased willingness to perform chores</li> </ul>