



ORIGINAL RESEARCH PAPER

Biological Science

ROLE OF STEM CELLS (AUTOLOGOUS) IN TREATMENT OF CEREBRAL PALSY IN CHILDREN

KEY WORDS: Cerebral Palsy; Autologous Stem Cells, Spasticity; Spinal Thecal Space

Dr. Vijay Rajesh. Andanamala*

MTech-Bio-Technology, Ph.D., S/o Sundaraiah.A, Deputy Superintendent Of Police(RETD) Door No:1-2-89/4A ,SVN Colony 7/2, Guntur-522006, Andhra Pradesh, India *Corresponding Author

Dr. Naga Sankar. Vemuri

M.S., M.Ch. (Neurosurgery), Raghavendra Hospitals, Opp. Street to Sivalayam, D.No. 12-14-2, Kothapet, Guntur-522001, Andhra Pradesh, INDIA

Dr. P Ramana Kumari

M.B.B.S., M.D., (Pathology), Associate Professor, Department of Pathology, Guntur Medical College, Government of Andhra Pradesh, Consultant Pathologist, Raghavendra Hospitals

ABSTRACT

Cerebral palsy is a severe disease with incidence being 8 to 12 births worldwide. This disease is not repairable one but autologous stem cell therapy treatment is considered as one of the treatment potential. So the team injected the autologous mononuclear cells extracted from the same patient bone marrow in to spinal thecal space moderate relief from spasticity, ambulant without support, control over bladder and bowel has been achieved. Frequency of seizures decreased as results of autologous stem cell therapy.

Introduction:

Cerebral palsy is the neurological disorder prevalent in children worldwide 8-12 per 100 live birth. Its ratio is slightly increasing now a days. Cerebral palsy describes a group of disorders in development of posture, movement causing activity limitations. There are disturbances in sensation, perception, cognition, behaviour and seizures

There are so many therapeutic modalities like occupational and speech therapy medical and surgical modalities etc. These treatments are useful to some extent. But none are involved in recovery of damaged brain. Autologous stem cell therapy is effective in treating CP

Case Report

An eight years old boy was diagnosed with cerebral palsy in 2012 and all the treatments he took was in vain. In 2015 he was brought to our center and we have explained the child patents about autologous mononuclear cell therapy (Stem Cells) pros and cons of the therapy was explained to them written consent was taken from patients parents to do autologous mononuclear cell therapy (Autologous Stem Cells)

Pre OP routine investigations like haemogram with pathologist opinion, random blood sugar, renal functions tests, liver function test, coagulation profile, Blood grouping RH typing and complete viral markers

All of them revealed no abnormality and they were with in biological limits complete urine examination was done which revealed no pathology ultrasonography of abdomen for him revealed normal study. EEG showed profuse multifocal epileptical activity. The aspiration of bone marrow was done by the pathologist from sternum, right & left posterior superior spine. 100ml of marrow was collected from patient. Under general anesthesia (Propofol + Medazolam) with O₂ supplementation by senior anaesthetist using standard procedural guidelines. Then the sample was transferred to stem cell isolation room under strict aseptic conditions Autologous Mono Nuclear cells were separated and isolated under strict aseptic mode by density gradient centrifugation by post Graduate Engineer and Doctorate in Bio –Technology. The cell count was 120.1 x 10⁵. These cells were injected into spinal thecal space that is L₄-L₅ spaces by Neuro surgeon aseptically

Clinician Infused methyl prednisolone 250ml intravenously during the procedure to this boy to archive immunosuppression status and granulocyte colony stimulating factor injection one micro gram per kg body weight was given two days consequently prior to

therapy and one day after this therapy helped in stimulation of CD³⁴⁺ cells and also in their survival and multiplication. Third generation cephalosporin was given 10days to this boy following therapy. After therapy he underwent rigorous speech therapy and occupation therapy

Result and Conclusion

Satisfactory outcome is there in this case after stem cell therapy autologous bone marrow derived mononuclear cells have no ethical issues, No adverse events and No immunologic reactions. This case demonstrated the successful outcome in cerebral palsy. 2 Months after the therapy motor moments achieved, eye to eye contact developed, Hearing is improved and seizure frequency was reduced

Acknowledgements

My immense heartfelt Thanks to the lord almighty who is guiding me all through to make this work in to tremendous success.

I am thankful to my family members who constantly supported me to carry on this work.

I would like to acknowledge my well wishers, Dr. K. Naveen Krishna, M.D., D.M. (Cardiology); PGI Chandigarh; Dr. K. Vamsi Krishna, M.D., D.M., P.D.F (Interventional Cardiology); Pratik Raj; M. Goutham; A. Goutham Sai Krishna; Dr. U Surya Kumari, M.D., D.G.O., M.Ch. (Urology); Dr. P. Anil Kumar, M.D. (Pediatrics); Dr. D Latha, M.D. (Pediatrics); Dr. M. N. Chary, M.D (RD); Dr. K. Murali Krishna, M.D.,D.M.; Dr. T. Naveen, M.D., D.M. (Neuro) P.D.F; Dr. K. Sai Satish , M.D., D.M. (Neuro) P.D.F for their support to carry this work

References

1. Yeargin-Allsopp M, Van Naarden Braun K, Doernberg NS, Benedict RE, Kirby RS, Durkin MS: Prevalence of cerebral palsy in 8-Years-Old Children in three areas of the United States in 2002: a multisite collaboration. *Pediatrics*. 2008, 121-547-554. 10.1542/peds.2007-1270.
2. Koman LA, Smith BP, Shilt JS: Cerebral palsy. *Lancet*.2001,363:1619-1631. 10.1016/S0140-6736(04)16207-7.
3. Holt RL, Mikati MA: Care for child development: basic sciences rationale and effects of interventions. *Pediatr Neurol*. 2011, 44:239-253. 10.1016/j.pediatrneurol.2010.11.009.