

# Autologous Stem Cell Transplantation is reported effective in children with Cerebral Palsy (N=116)

De Munter, J.P.J.M. | Tamaschke, U.K. | Elsis, A. | Happich, D. | Kleinbloesem, C.H.

## Introduction

Cerebral Palsy is a chronic non-progressive disorder, manifesting with spastic paralysis often in combination with epileptic seizures and/or mental impairment, caused by damage to the frontal cortical (mainly motor) area of the developing brain, mostly during pregnancy<sup>1</sup>. The incidence of Cerebral Palsy varies between 2.12 to 2.45 per 1000 live births<sup>1,2</sup>. At the moment there is no cure for Cerebral Palsy<sup>3</sup>. Based on recent findings, treatment with adult Autologous Stem Cells (ASC) derived from bone marrow seems to be a promising therapy to improve the condition of the patients suffering from Cerebral Palsy<sup>4</sup>.

## Methods

133 patients with Cerebral Palsy were treated with adult autologous stem cells derived from the bone marrow. The mean age of the patients was 11.5 years; 50% was below 7.0 years; gender distribution was equal.

After collection of the bone marrow, the stem cells were separated from the bone marrow by centrifugation techniques followed by quality assessment of the samples by flow cytometry. The stem cells were injected intrathecally by lumbar puncture. After treatment, the caregivers of the patients were invited to participate in a post treatment survey.

## Results

116 patients (more than 90 %) returned the completed evaluation form. Clinical improvements (Figure 1) were reported in most patients (66.4%).

Improvements mainly included increased motor functioning with decreased spasticity, resulting in improved sitting, standing, walking and posture stability, as well as an improvement in mental functions resulting in better communication (see Figure 2, Figure 3 and Figure 4). Improvement of speech was mentioned by 28 patients, and a major reduction or even absence of epileptic seizures during the recorded post-treatment period was reported by 11 responders. More than 90% of all the improvements started within 8 weeks after the application of Autologous Stem Cells.

Adverse events, other than those normally to be expected in lumbar puncture, were not reported.

## Conclusions

In summary, 66.4% of the responding Cerebral Palsy patients reported clinical improvement after treatment with adult Autologous Stem Cell transplantation.

Autologous Stem Cell transplantation not only seems to be a safe, but also a potentially clinically effective therapy for this group of patients. These results encourage to perform double blind randomized control clinical trials in these patients in the near future.

## References

1. Pharoah PO. Epidemiology of cerebral palsy: a review. Journal of the Royal Society of medicine. Jul 1981;74(7):516-520.
2. Westbom L, Hagglund G, Nordmark E. Cerebral palsy in a total population of 4-11 year olds in Southern Sweden. Prevalence and distribution according to different CP classification systems. BMC pediatrics. 2007;7:41.
3. O'Shea TM. Diagnosis, treatment, and prevention of cerebral palsy. Clinical obstetrics and gynecology. Dec 2008;51(4):816-828.
4. Goldman SA, Schanz S, Windrem MS. Stem cell-based strategies for treating pediatric disorders of myelin. Human molecular genetics. Apr 15 2008;17(R1):R76-83.

