



Treatment in children with CP by Hippotherapy: experiences and results

Maria Pia Onofri, MD, Annalisa Roscio, PT, Roberta Giobellina, PT, Michele Nichelatti, PhD*, Chiara Luzzoli, PT, Emilio Brunati, MD
Unità Operativa Neuropsichiatria dell'Infanzia e dell'Adolescenza, Centro di riabilitazione equestre "Vittorio di Capua"
*Service of Biostatistics
A.O Ospedale Niguarda Ca' Granda, Milano



"Vittorio di Capua" Center is part of the UONPIA (Unità Operativa Neuropsichiatria dell' Infanzia e dell' Adolescenza) of A.O. Ospedale Niguarda (Milan, Italy) and it collaborates closely with all clinical wards of this general hospital. Our Medical Team introduced horses in rehabilitation since 1981, assuming that the mutual corporeal interaction between patient and horse and the subsequent emotional activation could ease the separation-individuation process. At the same time, such process could define body-image and help out a child to structure a harmonic personality. Besides, from a physical point of view, working on a moving element does stimulate postural control and balance, sensitive and sensorial stimuli experience in time and space and its integration at a cortical level. The therapy in stimulating and highly motivating environment (often with other children) does prevent withdrawal and isolation, all phenomena that Cerebral Palsy itself – together with the harshness of medical remedies – do favour.



Number Patient	Sex		Age		Clinical features		Co-morbidity	
	F	M	4 – 12 y	8 p	Diplegic	8 p	Premature birth	9 p
16 p	3 p	13 p	Under 5 y	8 p	Emiplegic	5 p	Epilepsy	8 p
			Over 6 y	8 p	Tetraplegic	3 p	Autistic Features	2 p
							Mental Retardation	9 p

WORKING METHODOLOGY

Inclusion criteria: all patients affected by CP that were treated during 2011.

Exclusion criteria: seizures uncontrolled by medication, musculoskeletal conditions that could be exacerbated by Hippotherapy such as atlantoaxial or other vertebral instability, severe scoliosis, osteoporosis and hip luxation

Hippotherapy treatment was performed once a week over 40 sessions.

Our horses are prepared by our equestrian team to be reliable, to have harmonic movements and they are different in size, walking and attitude.

A trained horse is selected for each child, according to his or her rehabilitative programme, tacked with a blanket and a surcingle having a mobile or fixed handle.

The horse is walking without any bit and by hand of a specialized assistant and the child wears no helmet.

The therapist works by the horse and in two severe cases is riding with the patient.

The sessions were carried out by a therapist and an assistant together, both specialized in Hippotherapy at our State General Hospital.



Surcingle with a mobile handle

Surcingle with a fixed handle



The length of each session of the treatment was 30 minutes. Combined with the Hippotherapy, the child had an additional activity, tailor-made to our particular setting during 30 extra-minutes.

The patients are positioned according to their postural ability. The horse walking offers an opportunity to practice actively postural and balance strategies.

The therapist decides to modify the horse's movements (speed of gait, start and stop, change of direction, etc.) depending on the needs and responses of the patient.

In addition, each child practices active exercises, according to his or her personal rehabilitative programme.

Clinical evaluation, video-recording and discussion in our multidisciplinary team were performed every three months.



Before starting the treatment, each patient was examined by our multidisciplinary team and has been object of:

- Clinical history in order to assess the family background, degree of education, medications and previous therapies;
- Clinical assessment in order to confirm the diagnosis and find out possible contra-indications and cautions;
- Functional assessment with video recorder;
- Gross Motor Function Measure, Vineland Scale, Development and Intelligence scales, Projective Test, language questionnaire.

After 40 Hippotherapy sessions we performed:

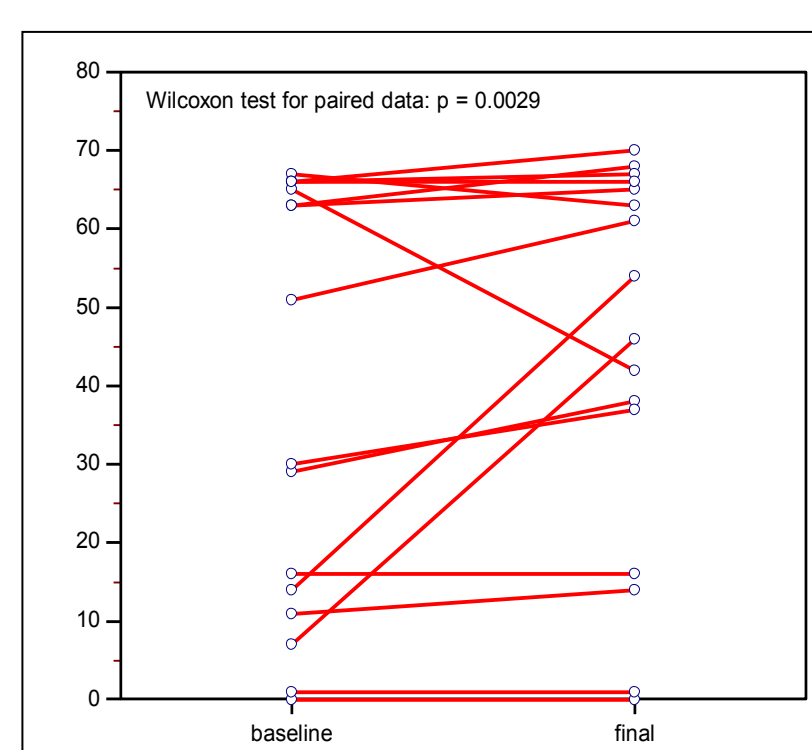
- Clinical interview with the parents, functional assessment of the child and video recording
- Gross Motor Functional Measure
- Vineland Scale
- Projective Test (so called "carta e matita" Test)
- Speech language questionnaire

A rehabilitative project was tailor-made for each patient

RESULTS AND OUTCOMES

Gross Motor Functional Measure

The total score is statistically significant (p = 0.0029)

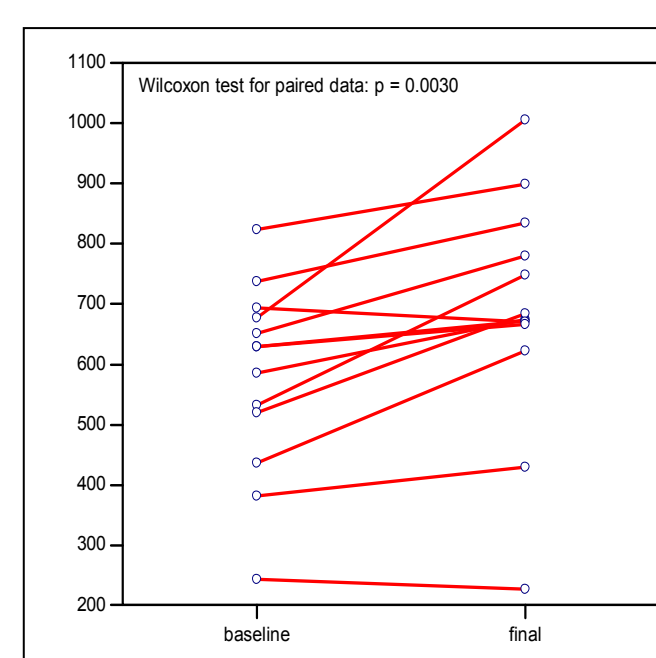


Analysing the five sub-items by Wilcoxon test for paired data, we saw the following results:
dimension A (lying and rolling) improved but not in a statistically significant way;
dimension B (sitting) is the one displaying the best improvement (p = 0.0088);
dimension C (crawling and kneeling) showed a significant improvement (p = 0.0421)
dimension D (standing) improved, but not significantly;
dimension E (walking, running and jumping) showed a significant improvement (p = 0.0344)

In other words, all figures improved.

Vineland Adaptive Behavior Scales

The variation in total score is statistically significant (p = 0.0030)



Analysing the four sub-items by Wilcoxon test for paired data, we observed that changes in *Communication* dimension are not statistically significant (p = 0.0804), despite its improvement, at least according to our speech language test. (It is relevant to note that 6 out of 16 patients were not Italian native-speakers and one did not speak at all).

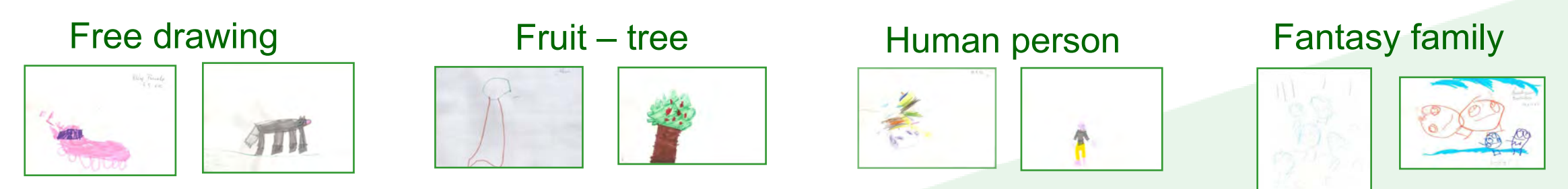
All other dimensions, e.g., *Daily Living Skills* (p = 0.0277), *Socialization* (p = 0.0251), and *Motor Skills* (p = 0.0030), showed significant improvements.

In other words, communication exclusively did not improve in a statistically significant way.

Projective Test ("carta e matita") consists of five drawings (Free drawing; Fruit – tree; Human person; Fantasy family; Real family)

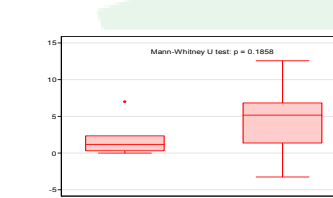
2 patients did not improve

14 patients improved spatial organisation, corporeal image and graphic competence, according to age and cognitive capacities ability to express feelings and part of real experiences. They also improved the so-called symbolization

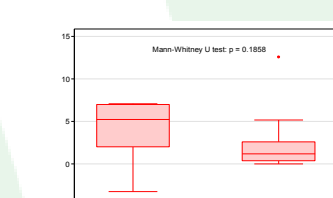


DISCUSSION

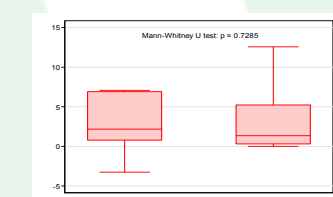
We managed to correlate the outcomes by Gross Motor Test with physiotherapy, mental retardation, the presence of epilepsy, pre-term birth, the age. Due to the exiguity of our sample, we used Mann-Whitney U Test



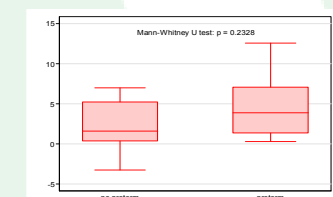
Physiotherapy - the difference between the patients that are practicing Hippotherapy only opposite to the ones that are practicing Hippotherapy together with physiotherapy, is not statistically relevant, even if the patients that do practice the two together improve in a more sensible way.



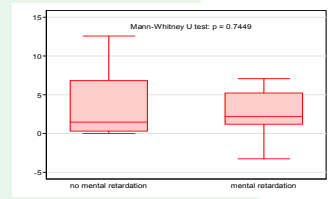
Mental Retardation - Patients with mental retardation seem to get remarkable benefit from Hippotherapy, because Hippotherapy is therapeutic on mental retardation alone due to the stimulating experience also at cognitive level.



Epilepsy - Its presence is not statistically relevant, even if patients not affected by epilepsy present a more significant trend of improvement. It is relevant to underline that our epilepsy patients are treated with medication and epilepsy is under control. If not, it does represent a contraindication.



Pre-term birth - There is no relevant difference between the two groups, e.g. the pre-term born babies and the babies born at term. However, the trend is remarkably favorable for the pre-term babies who happen to improve 60% more than the babies born at term.



Age - The age does not appear statistically relevant in determining the improvement. However, if one takes the median as the reference, one can notice that a child aged less than 6 years has the 70% of chances to improve compared to a child aged above 6. Analyzing any child belonging to both age groups, one can notice that increasing the age by one year corresponds to the decrease of the improvement of 0.02 points. Still, the score not being statistically relevant is due to the exiguity of the two groups that are too narrow.

Hippotherapy is helpful to promote the child's development in all areas.

It is a useful way to treat persons with disabilities in a whole, and not only in order to treat single dysfunctional areas. We obtained a statistically relevant improvement both in motricity and in behaviour.

Improvements are noticed also at a social level in the adaptive skills, communication and socialization, as proved above.

Clinically, via interviews with parents and videos, improvement of a general well-being, quality of life and mood was also stated.

THEORETICAL INUENDOS

- OMS guide-lines regarding damage, disability and handicap
- Manifesto for "la riabilitazione del bambino con PCI" (the child's rehabilitation with CP) by Gruppo italiano per la PCI, *Eur Med Phys*, 2000; 36 (4)
- Guide-lines for CP by "Società Italiana di Neuropsichiatria dell'Infanzia e dell'Adolescenza" (SINPIA 2006) www.sinpia.eu

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