

THE EFFECT OF MAHAMASHA TAILA INTERNALLY AND MASHASAINDHAVA TAILA EXTERNALLY IN SPASTICITY IN CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Cerebral Palsy is a leading cause of disability handicap in the child population. A single blinded therapeutic Randomized Controlled Trial was proposed to study the effect of *Mahamasha taila* internally and *Mashasaindhava taila* externally in relieving spasticity in children with Cerebral Palsy. Cerebral palsy children between 2 to 12 years, with Spastic Cerebral Palsy were included in the study. Twenty four cases were enrolled into the study; the participants were randomly allocated into two groups – study and control. The study group was subjected to internal administration of *Mahamasha taila* and external application of *Mashasaindhava taila*. The control group was given only external application of *Mashasaindhava taila*. Assessment was made at three consecutive phases – before treatment, after treatment of 1 month and after follow up for 2 months. Spasticity of limbs was assessed using Modified Ashworth Scale and range of motion of joints was measured using Goniometer. The responses obtained at the end of each phase were analyzed statistically. Statistical analysis of the data revealed that there was significantly higher improvement in study group than control group, which proved that internal administration of *Mahamasha taila* and external application of *Mashasaindhava taila* is effective in reducing spasticity in children with Cerebral Palsy.

Keywords: Cerebral palsy, spasticity, *sankuchithanga*, *Mahamasha taila*, *Mashasaindhava taila*.

INTRODUCTION

Cerebral palsy is a prevalent form of disability among children all over the world. It can be defined as a non progressive neuromotor disorder of cerebral origin and includes a group of heterogeneous clinical states of variable etiology and severity ranging

from minor incapacitation to total handicap.(1)The term Cerebral Palsy (CP) was originally coined more than a century ago. Cerebral refers to the cerebrum, and palsy refers to disorder of movement or paralysis and so it can be vaguely translated as “brain

paralysis".(2)According to resting tone and topographic distribution, CP can be classified as: Spastic, Hypotonic or atonic, Extrapyramidal, Cerebellar or ataxic and mixed CP.

Spastic cerebral palsy is the type of cerebral palsy wherein spasticity is either the dominant or exclusive impairment present. It is by far the most common type of overall cerebral palsy. It can be diplegic CP, hemiplegic CP, and Quadriplegic CP etc according to topographic distribution. The stretch tendon reflexes are always brisk. They have variable degrees of mental, visual handicaps and behavioural problems.(3)There was always an incessant quest of enquiry regarding management of spasticity in Cerebral palsy case from all branches of medicine. An alternative treatment modality for spasticity in Cerebral Palsy which is less expensive, easily applicable, less complicated and with high efficacy has become a necessity and is the first aim of the research.

A standard treatment modality was developed and is in practice in the Department of *Kaumarabhritya*, Govt. Ayurveda College Hospital for Women and Children for the past many years. Conventional *Vata roga* treatment is found to be effective in treating spasticity.

Mahamasha thailam has been mentioned in the context of *Vatavyadhi chikitsa*.It cures almost all *Vata* disorders including hemiplegia, facial paralysis, sciatica, trembling of hand, foot, head and neck, slow movement etc. It can be used in the form of oral intake, enema, nasal instillation, dropping in eyes and ears and also externally for body massage. Previous study in the same formulation revealed that it is effective in

reducing sensory neural hearing loss (*Badhira*).(4)

Mashasaindhava taila has been mentioned in the context of *Vatavyadhi chikitsa* in *Ashtanga Hrudaya*. It is used for *Abhyanga* in the treatment of spasticity (*sankuchitha anga*). (5)

So a Therapeutic, Single blinded, Randomized Controlled Trial was designed with a control to prove the effect of administration of *Mahamasha taila* internally and *Mashasaindhava taila* externally in spasticity in children with Cerebral Palsy.

Aim and objectives of the study

The study was intended to find the effect of *Mahamashataila* internally and *Mashasaindhavataila* externally in spasticity in children with Cerebral Palsy. Internationally accepted parameters were used for the assessment. The study was also aimed at assessing the stability of the effect of the procedure suggested.

Materials and method

The method of the study was Therapeutic Single Blinded Randomized Controlled trial. The children who fulfilled the inclusion criteria were clinically assessed. The selected children were distributed equally by simple random sampling technique into trial group and control group. The children in trial group were subjected to internal administration of *Mahamasha taila* (in a daily dose, 2.5 ml for children aged 2-6 years and 7 ml for children aged 7-12 years- given in divided doses) and external application of *Mashasaindhava Taila* for 30 minutes per day for 1 month. Children in control group were

subjected only to external application of *Mashasaindhava Taila*. Both the groups were assessed before and after the treatment and after a follow up period of 2 months.

Inclusion criteria

Children between 2 to 12 years affected with spastic cerebral palsy were included in the study.

Exclusion criteria

Children with spasticity associated

with the following conditions were excluded from the study: Spinal cord lesions, Trauma, tumour, stroke etc, Multiple sclerosis, congenital diseases, chronic illness and other developmental disorders.

Assessment criteria

- Spasticity was assessed using Modified Ashworth Scale.
- Range of movement measurement of various joints using Goniometer.

1. Modified Ashworth Scale (6)

➤ Score 0	➤ No increase in muscle tone
➤ Score 1	➤ Slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the end range of motion when the part is moved in flexion or extension/abduction or adduction, etc.
➤ Score 1+	➤ Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the ROM
➤ Score 2	➤ More marked increase in muscle tone through most of the ROM, but the affected part is easily moved
➤ Score 3	➤ Considerable increase in muscle tone, passive movement is difficult
➤ Score 4	➤ Affected part is rigid in flexion or extension (abduction, adduction, etc.)

2. Range of movement

Limbs are moved passively and range of movement at various joints was assessed using Goniometer. Head must be in midline as turning to one side changes tone.(7)

- Angle of Dorsiflexion: The normal angle is 45 degrees.
- Adductor angle: The normal angle is 130 – 150 degrees.
- Heel to Ear maneuver: The normal range is 140 – 170 degrees.
- Popliteal angle: The Normal range is 150 – 170 degrees.
- Angle of wrist joint in flexion: The Normal angle is 60 degrees.
- Angle of elbow in extension: The normal

angle is 180 degrees

- Angle of shoulder joint: The Normal angle is 180 degrees.

Treatment schedule

The children in the study group were subjected to internal administration of *Mahamashataila* in a daily divided dose of 2.5 ml for children aged 2-6 years and 7 ml for children aged 7 – 12 years and also external application of *Mashasaindhavataila* for 30 minutes per day for 1 month. The children in control group were subjected only to external administration of *MashasaindhavaTaila* for the same duration as that of study group.

Data collection

The clinical parameters were graded and their variations were recorded by researcher. Both the groups were assessed before and after the study for the change in clinical criteria using specific parameters. Both the groups were also followed up for a period of 60 days. The findings were entered

in the observation sheet which was meant exclusively for the study. Periodical review was done.

Observation and result

Assessment of spasticity using Modified Ashworth Scale

Table 1: Paired comparison of Spasticity of right upper limb

Spasticity of right Upper limb		Upper limb right	
		BT – AT	BT - AF
Study group	Z	-2.530	-2.810
	p	.011	.005
Control group	Z	-1.000	-2.000
	p	.317	.046

The improvement in spasticity of right upper limb of the two groups was compared using Mann Whitney U test for assessing statistical significance. More improvement had occurred in the study group patients after treatment with a highest level of statistical significance with a p value <0.05, indicated the better response of the study group than the

control group. When the after follow up response was analysed, a statistically significant response was reported with a p value <0.05 (p=0.021) indicated that the study group showed a better response to the treatment in relieving spasticity of right upper limb even after follow up period.

Table 2: Paired comparison of Spasticity of Left Upper limb

Spasticity of left upper limb		Upper limb left	
		BT - AT	BT - AF
Study group	Z	-2.828	-2.640
	p	.005	.008
Control group	Z	-2.000	-2.000
	p	.046	.046

The between groups comparison of the spasticity of left upper limb showed that comparable improvement had occurred in the

study group and control group patients after treatment (p=0.094) and after follow up (p=0.058).

Table 3: Paired comparison of Spasticity of right lower limb

Spasticity of right lower limb		Rt. Lower limb	
		BT-AT	BT-AF
Study group	Z	-2.810	-2.640
	p	0.005	0.008
Control group	Z	-2.236	-2.449
	p	0.025	0.014

The between groups comparison of the spasticity of right lower limb after treatment showed that more improvement had occurred in the study group patients after treatment with a highest level of statistical significance with a

p value <0.05. When the after follow up response was analysed, a statistically non significant response was reported with a p value >0.05 (p=0.062).

Table 4: Paired comparison of Spasticity of left lower limb

Spasticity of left lower limb		Left lower limb	
		BT - AT	BT - AF
Study group	Z	-2.762	-2.850
	p	0.006	0.004
Control group	Z	-1.000	-2.121
	p	0.317	0.034

More improvement had occurred in the study group patients after treatment with a highest level of statistical significance with a p value <0.05. When the after follow up response was

analysed, a statistically significant response was reported with a p value <0.05 (p=0.012) .

Goniometric measurement of angles:

Table 5: Paired difference of Adductor angle

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	Sd		
Adductor angle	BT-AT	8.2	3.3	4.3	1.7	3.518	0.002
	BT- AF	10.4	3.5	6.2	2.6	3.147	0.005

The average change in the study group was 8.2 ± 3.3 and in the control group was 4.3 ± 1.7. Since the p<0.05, with a t value 3.518, there was a statistically significant difference between the two groups in improvement of the

Adductor angle after treatment. The average change after follow up in the study group was 10.4±3.5 whereas in the control group was 6.2±2.6 (p value<0.05.)

Table 6: Paired difference of Popliteal angle

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	Sd		
Popliteal angle- right	BT-AT	5.8	1.9	4.9	2.0	1.076	0.295
	BT- AF	8.6	2.7	5.9	2.8	2.356	0.029
Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Popliteal angle- left	BT-AT	5.6	2.3	2.5	2.2	3.190	0.005
	BT- AF	7.9	4.2	3.7	2.3	2.923	0.008

The average change of the Popliteal angle of right side, after treatment was 5.8 ± 1.9 in the study group and 4.9 ± 2 in control group. The t value was 1.076 with $p > 0.05$. The study group subjects responded well with a

statistical significance of $p < 0.05$ after follow up period also. The Popliteal angle of left side showed better response immediately after treatment and after follow up with $p < 0.05$.

Table 7: Paired difference of Angle of Dorsiflexion

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Angle of Dorsiflexion- right	BT-AT	-2.9	3.5	-2.3	3.6	-0.423	0.677
	BT- AF	-3.7	4.4	-2.6	4.8	-0.553	0.587
Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Angle of Dorsiflexion- Left	BT-AT	-2.1	3.2	-1.9	2.7	-0.144	0.887
	BT- AF	-2.3	3.5	-2.5	4.2	0.110	0.913

Since the $p > 0.05$, there was no statistically significant difference between the two groups in improvement of the

Dorsiflexion angle of both sides after treatment and after follow up.

Table 8: Paired difference of Heel to Ear angle

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Heel to Ear angle - right	BT-AT	5.1	2.9	3.5	1.6	1.624	0.120
	BT- AF	6.5	3.4	5.4	1.7	1.028	0.316
Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Heel to Ear angle - Left	BT-AT	3.5	1.7	3.2	0.8	0.651	0.523
	BT- AF	4.2	1.9	4.2	1.5	0.000	1.000

The results obtained were comparable between the two groups as the $p > 0.05$, showed equal response of the study subjects

and the control group individuals both after treatment and after follow up.

Table 9: Paired difference of Wrist angle

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Wrist angle - left	BT-AT	-3.5	2.5	-1.2	2.8	-2.078	0.051
	BT- AF	-4.5	3.2	-1.0	4.0	-2.294	0.033
Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Wrist angle- right	BT-AT	-4.0	2.4	0.5	3.0	-3.883	0.001
	BT- AF	-4.5	3.2	1.1	3.8	-3.727	0.001

The average change of angle of Wrist angle of right side in the study group was -3.5 ± 2.5 and in the control group was -1.2 ± 2.8 after treatment ($p > 0.05$, with a t value -2.078). The average change after follow up in the study group was -4.5 ± 3.2 whereas in the control group was -1.0 ± 4.0 (p value < 0.05).

Considering the Wrist angle of left side the average change after treatment in study group was -4.0 ± 2.4 and that in the control group was 0.5 ± 3.0 ($p < 0.05$). Since the p value < 0.05 , the improvement in Wrist angle of left side was more in the study group than in the control group after follow up also.

Table 10: Paired difference of Elbow angle

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Elbow angle -left	BT-AT	5.0	4.7	2.0	0.9	2.093	0.049
	BT- AF	5.5	5.5	3.3	0.9	1.306	0.206
Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Elbow angle Rt	BT-AT	5.5	5.5	3.1	1.2	1.400	0.177
	BT- AF	6.5	6.6	4.5	1.9	0.960	0.349

The average change of the elbow angle of right side after treatment was 5.0 ± 4.7 in the study group and 2.0 ± 0.9 in control group (t value was 2.093 with $p < 0.05$). After follow up, the results obtained was comparable

between the two groups as the $p > 0.05$. The Elbow angle of left side also showed equal response immediately after treatment and after follow up with $p > 0.05$.

Table 11: Paired difference of Shoulder angle

Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Shoulder angle -right	BT-AT	4.8	1.8	2.7	2.0	2.206	0.042
	BT- AF	5.5	2.3	4.3	2.2	1.234	0.032
Paired difference from BT		Study group		Control group		t	p
		mean	sd	mean	sd		
Shoulder angle -left	BT-AT	5.4	3.1	2.5	2.1	2.523	0.020
	BT- AF	6.7	3.2	4.1	3.4	1.868	0.076

While considering the Shoulder angle of right side, the average change after treatment was 4.8 ± 1.8 in the study group and 2.7 ± 2.0 in control group. The t value was 2.206 with $p < 0.05$. After follow up also, the study group showed better result than control group as the p value < 0.05 . The Shoulder angle of left side also showed significant response immediately after treatment in the study group. After follow up, as $p > 0.05$, it can be pointed out that both the treatment modalities responded almost equally well in relieving the symptoms.

DISCUSSION

Cerebral Palsy is an umbrella term encompassing a group of non progressive neuromotor disorder of cerebral origin. This group of disorders affecting the movement and posture is believed to arise from an injury or insult to the developing foetal or infant brain. Spasticity of limbs can be considered as a *Vata* predominant clinical manifestation (*sankuchithaanga*). So *Vatavyadhi* treatment was adopted in this condition. Study was conducted to test the effect of *Mahamashataila* internally and *Mashasaindhavataila* externally in reducing spasticity in Cerebral palsy in children between 2 to 12 years, by using the internationally accepted assessment criteria.

The total participants in the study were randomly allocated into study and control groups. The subjects in study group were subjected to internal administration of *Mahamashataila* and external application of *Mashasaindhavataila*. The control group members were given only external application of *Mashasaindhavataila*. Physiotherapy, being the standard procedure was allowed to continue in both the groups throughout the course of treatment and follow up.

Within the group statistical analysis of the muscle tone revealed that significant improvement had occurred in the spasticity of all the four limbs in the study group. In the control group also there was significant improvement in spasticity of limbs after treatment and after follow up except in case of right upper limb and left lower limb just after treatment. The effect of treatment showed sustained effect after follow up for two months. While comparing between the groups, the improvement that occurred in study group after treatment was significantly higher than control group in all limbs except left upper limb. Similarly significantly more improvement was found in spasticity of right upper limb and left lower limb after follow up. From these data we can infer that the study group intervention is significantly effective in

reducing spasticity.

Analysis of range of motion of joints showed that significant change had occurred in study group than the control group, both after treatment and after follow up in Goniometric assessment of Adductor angle, Popliteal angle of left side, Wrist angle of right side and Shoulder angle of right side. Sustained effect of the treatment after follow up was found to be significant in the study group than the control group while considering Popliteal angle of right side and wrist angle of left side. Significant improvement just after treatment occurred in the Elbow angle of left side in the study group than in the control group. Analysis of all the other angles gave comparable results between the two groups both after treatment and after follow up as the p value >0.05.

In total, the study group showed significant improvement after treatment and after follow up excepting a few variables. Therefore the combination of *Mahamasha taila* internal administration and *Mashasaindhava taila* external application is significant in reducing spasticity in children with Cerebral Palsy.

CONCLUSION

The combined effect of *Mahamasha taila* internal administration and *Mashasaindhava taila* external application is superior to external application of *Mashasaindhava taila* alone. The treatment procedure also improved range of motion of various joints. The effect of the treatment was sustained for a duration of two months. Daily motor activities also improved with the treatment.

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REFERENCES

1. O.P.Ghai, Essential Pediatrics, Mehta Publishers, 7th edition, Pg.no-559-560.
2. <http://www.integraronline.com.br/admin/download/20100324235948.pdf>
3. Piloo. E.Balucha and E.P.Balucha, Textbook of pediatrics Vol-3, Jaypee Brothers publications, revised first edition, Pg. No. 2166 – 2167.
4. Sreedivya et al, (2006) “The effect of *Mahamasha thailam* as *shiropichu* in *badhiryam* (with special reference to sensori-neural hearing loss) in children up to 12 years.”MD, Dept. of Kaumarabhrithya, Govt. Ayurveda College, Thiruvananthapuram.
5. Vagbhata, Ashtanga Hrudayam, translated by Prof. K.R. Srikantha Murthy, Vol-2, Chowkhambha Publications, 5th Edition, Chapter – 21, Pg. No. 501.
6. <http://www.ncbi.nlm.nih.gov/pubmed/3809245>
7. Santhosh Kumar, Handbook of Pediatrics, All India Publishers and Distributors, 2nd edition, 2008, Pg No.231.

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