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Research Article

ROLE OF *MATRA BASTI* (ENEMA) OVER *ABHYANGA* (MASSAGE) AND *SWEDA* (SUDATION) IN REDUCING SPASTICITY IN CEREBRAL PALSY WITH *SUDDHA BALA TAILA*-A RANDOMIZED COMPARATIVE CLINICAL STUDY

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ABSTRACT

Objective of the study was to assess the efficacy of *Matra basti* (enema) over *Abhyanga* (massage) and *Sweda* (sudation) in reducing spasticity in cerebral palsy. Study was carried out in IPD, Department of *Kaumarbhritya*, KLE's Shri BMK Ayurved Mahavidyalaya, Shahapur, Belgaum, Karnataka; India.30 children fulfilling diagnostic criteria between the age group of 2-12 years were included and enrolled as per computer generated block randomization into 2 groups of 15 children in each group. Group A was administered with *Matra basti* (enema) after local *Abhyanga* (massage) with *Suddha bala taila* and local *Swedana* (sudation) with *Nadi sweda* (type of sudation) method for a duration of 15 days. In group B spastic children were treated with *Sarvanga Abhyanga* (massage all over body) followed by plain *Nadi sweda* with *Suddha bala taila*. Follow up was done on 30th and 45th day of treatment. Both the procedures were helpful in reducing spasticity. *Matra basti* (enema) is more effective in treating the spasticity of cerebral palsy as compared to *Abhyanga* (massage) *and Sweda*, whereas *Abhyanga* (massage) and *Sweda* (sudation) is effective in treating fine motor functions. *Suddha Bala taila* is effective in treating *Ekanga vata* (monoplegia), *Pakshaghata* (diplegia) and other related *Vata Vyadhi* (neurological disorders) as attributed to its *Rogaghnata* (disease). Thus the procedures are effecting in reducing spasticity.

KEYWORDS: Cerebral palsy, Spasticity, *Matra basti*, *Abhyanga* and *Sweda*, *Suddha bala taila*, *Vata vyadhi* (neurological disorders).

INTRODUCTION

Spasticity is most common symptom in Cerebral palsy (CP) and occurs in 70-80% of all cases[1]. Children with cerebral palsy have impairments that interfere with motor functions, activity and participation[2]. According to WHO estimation, in India 3.8% of population[3] has some form of disability resulting from CP. In existing treatment, several drugs have been used to treat spasticity, including dantrolen sodium, the benzodiazepines, and baclofen. These medications are generally ineffective and often associated with side effects like sedation and lowered seizure threshold[4].

In *Ayurveda* Cerebral palsy can be approached as *Vatavyadhi*[5] (neurological disorders) based on the clinical presentation hence Spasticity demands a variety of interventions like *Shodana* (purification) and *Shamana* (palliative). *Basti* (enema) is prime line of treatment for any *Vatavikara*[6] (neurological disorders) and also considered as *Ardha chikitsa*[7]. Among the various types of *Basti* (enema) practiced for *Vata vyadhis* (neurological disorders). *Matrabasti* (enema) is said to be *Balya* (strengthening), *Brimhana* (nourishing) and *Vatarogahara*[8] (eliminates neurological disorders) similarly *Abhyanga* (massage) is

Kaphavatahara[9], *Pusti* (health promoting) and *Ayuvardhaka*[10] (increases life span).

MATERIALS AND METHODS

Objectives: To compare the efficacy of *Matrabasti* over *Abhyanga* (massage) and *Sweda* (sudation) with *Suddha Bala taila* in reducing spasticity among children suffering from cerebral palsy.

Source of Data: Patients were selected successively from the out- patient and in – patient department of *Kaumarbhritya,* Shree BMK Ayurved Mahavidyalaya, Shahapur, Belgaum.

Method of collection of Data

Inclusion Criteria: Children with spastic cerebral palsy of either sex between the age group of 2-12 years.

Exclusion Criteria: Children with non spastic cerebral palsy, with recurrent episodes of seizures or any other clinically unstable Conditions associated chronic systemic illness like metabolic disorders and any life threatening congenital anomalies like CHD etc.

Drug intervention: *Shuddha Bala Taila* as per *Sahasra Yoga*, *Taila prakarna* reference was prepared in KLE Ayurved Pharmacy, Shahapur, Belgaum and Pharmaco-chemical Analysis was carried out and authentified through CRF, KLE Ayurved Pharmacy, Shahapur, Belgaum.

Table No 1: *Suddha Bala Taila* Ingredients

INGREDIENTS	FORM
Bala Moola	*Kalka Dravya*
TilaTaila	*Snehadravya*
Bala Moola	*Kasayadravya*
Paya (milk)	*Drava Dravya*

Drug Preparation: *Bala moola* was washed with distilled water to remove dirt and soil, and shade dried. The dried material was pulverized (60 kg).The coarsely powdered material was taken and soaked overnight. Next morning the soaked drug was kept on fire for *Kasaya* preparation by adding 80 litres of water and after 3 days of *paka* 1/4th quantity of *Kasaya* was obtained. Later to this *Kasaya* 30 litres of authentified *Tila taila* was added and kept for Taila *paka* for 2days and on 3rd day 60 litres *Ksheera* was added. And stired to obtain *Taila siddhi lakshanas* and after *Taila siddhi pariksha* was performed 28.5 liters of *Taila* was sieved and collected in air tight container. The prepared *Taila* was subjected for physico chemical standards from C.R.F. K.L.E.'s Shri B. M. K. Ayurveda Mahavidyalaya, Shahapur, Belgaum. Finished Product Test Certificate under The Drugs And cosmetic Act 1940 and the rules there under. Rep ort No: CRF/MU/624/12

Research Design: Selected 30 patients were randomly divided into 2 groups with the randomization table generated through computer software.

Group A: In this group 15 patients of spastic cerebral palsy were administered *Matrabasti* (enema) with *Suddha bala taila* for a period of 15 days and were assessed after treatment and 45th day of study.

Group B: 15 patients of spasticity were included and treated with *Sarvanga Abhyanga* (massage) with *Suddha bala taila* and plain *Nadi sweda* for 15 days and were assessed.

Assessment criteria: Modified Ashworth Scale, Muscle Stretch Reflexes, Goniometry, Gross Motor Classification[11].

OBSERVATION

Age wise distribution of registered subjects shows that 56.67 %(n=17) were in 1-5 age group and 43.33 % (n=13) were in 6-12 age group. Sex wise distribution showed that 80% (n=24) are male and 20% (n=6) are females**.** Symptom wise presentation shows Difficulty in sitting was seen in 76.67% (n= 23), Difficulty in standing 70.00 % (n=21), Difficulty in walking 96.67% (n=29), Stiffness of the limbs 90% (n=27), Difficult movements 60.00% (n=18), Speech defect 33.33% (n=10), Mental retardation 13.33% (n=4), Consanguinity 33.33% (n=10). Observation on mother's status of health during pregnancy shows that 33.33% (n=10) were anemic, 40% (n=13) were healthy and 23.33% (n=7) were unhealthy. Observation on *Garbhini paricharya* of mother (ANC) showed that 46.67% (n=14) took allopathic care, traditional ANC was taken by 10% (n=3) and 43.33% (n=13) didn't undergo any ANC. Observation on maturity at birth of the child showed that 63.33% (n=19) wer0e premature and 36.67% (n=11) were full term. Observation on mode of delivery showed that 76.67% were delivered normally, 10% (n=3) by instrumental application and 13.33% (n=4) by operative procedure. Observation on complication of delivery showed that 30% (n=9) were born

without any difficulties, asphyxia was noticed in 36.67% (n=11) and fetal distress was seen in 33.33% (n=10) children. Observation on birth injury shows that 93.33% (n=28) had no injuries and 6.67% (n=2) had birth injuries and events predispose to instrumentation.

Discussion on effect of therapy: The effect of therapy was assessed in both the groups on 15th, 30th and 45th day of treatment. In Modified Ashworth Scale significant improvement are seen in *Matra basti* (enema) group in all time points assessed, hamstrings showed significant results after treatment, on plantar flexors significant results are seen in *Matra basti* group in all time points as compared to *Abhyanga* (massage) and *Sweda* group which showed significance after treatment.

Table 2: Modified Ashworth Scale

S.No	Parameters	Day 0 vs Day 15		Day 0 vs Day 30		Day 0 vs Day 45	
1.	Hip flexion	**Gp- A**	**Gp- B**	**Gp- A**	**Gp-B**	**Gp-A**	**Gp-B**
		P=0.0099*	P=0.0054*	P=0.0087*	P=0.0367*	P=0.0687*	P=0.1688
2.	Hamstrings	P=0.0277*	P=0.2132	P=0.2622	P=0.5286	P=0.6103	P=0.2361
3	Plantar flexors	P=0.0113*	P=0.0032*	P=0.0125*	P=0.1159	P=0.0191*	P=0.1549

Muscle stretch Reflexes: on knee joints significance is seen in *Abhyanga* (massage) and *Sweda* group after treatment, whereas significant results are seen on ankle joints in all time points.

Table 3: Muscle Stretch Reflexes

S.No	Parameters	Day 0 vs Day 15		Day 0 vs Day 30		Day 0 vs Day 45	
1.	Knee joints	**Gp - A**	**Gp - B**	**Gp - A**	**Gp - B**	**Gp -A**	**Gp - B**
		P=0.1088	P=0.0117*	P=1.0000	P=0.2076	P=0.5930	P=0.1098
2.	Ankle joints	P=0.0277*	P=0.0277*	P=0.0033*	P=0.4017	P=0.0033*	P=0.4017

Gross motor classification scale: *Abhyanga* (massage) and *Sweda* is significant on gross motor functions and highly significant in fine motor.

Table 4: Gross motor classification

S.No	Parameters	Day 0 vs Day 15		Day 0 vs Day 30		Day 0 vs Day 45	
1.	Gross motor	**Gp - A**	**Gp - B**	**Gp - A**	**Gp -B**	**Gp -A**	**Gp -B**
		P=0.768	P=0.0277*	P=0.157	P=0.017*	P=0.543	P=0.438
2.	Fine motor	P=0.9999	P=0.0077*	P=0.1088	P=0.0180*	P=0.0679	P=0.0180*

Goniometry: On hip flexions and hip flexion with bent knee *Matra basti* shows significant results in all time points. *Abhyanga* (massage) and *Sweda* shows significant results after treatment and during first follow in hip internal rotators, on hip extension significant results are seen in both *Matra basti* as well as *Abhyanga* (massage) and *Sweda* group. Highly significant results are seen on hip abductions in both the groups and the improvement is sustained during first follow up also. Highly significant results are seen on knee flexion after treatment in both the groups. Highly significant results are seen in both the groups on ankle inversion and aversion parameters in all time points.

Table 5: Goniometry

S.No	Parameters	Day 0 vs Day 15		Day 0 vs Day 30		Day 0 vs Day 45	
1	Hip flexion	**Gp - A**	**Gp - B**	**Gp - A**	**Gp - B**	**Gp -A**	**Gp - B**
		P=0.0004*	P=0.0049*	P=0.0001*	P=0.1860	P=0.0025*	P=0.5197
2	Hip flexion (bent knee)	P=0.0010*	P=0.0233*	P=0.0033*	P=0.0932	P=0.0420*	P=0.0748
3	Hip internal rotation	P=0.0017*	P=0.00001*	P=0.5748	P=0.0182*	P=0.7202	P=0.2501
4	Hip extension	P=0.0058*	P=0.00001*	P=0.0031*	P=0.0041*	P=0.0065*	P=0.0565
5	Hip abduction	P=0.00001*	P=0.00001*	P=0.0500*	P=0.0119*	P=0.1073	P=0.0912
6	Knee flexion	P=0.0008*	P=0.00001*	P=0.0073*	P=0.3399	P=0.1284	P=0.3080
7	Ankle Inversion	P=0.0003*	P=0.0008*	P=0.00001*	P=0.0023*	P=0.0002*	P=0.0154*
8	Ankle aversion	P=0.00001*	P=0.0004*	P=0.0010*	P=0.0022*	P=0.0378*	P=0.0279*

Probable Mode of Action: *Basti* is the best treatment for *vata*. *Pakwashaya* is the *moola sthana* (main seat) of *vata dosha*. Thus, by its action on the *moola sthana* gets control on *vata* all over the body. *Sushruta* has mentioned 6th *basti* nourishes *mamsa dhatu*, 7th *basti dhatu* nourishes *meda dhatu*, 8th *basti* nourishes *asthi dhatu* and 9th *basti* nourishes *majja dhatu*. Thus, by *basti* we achieve *vata dosha shamana* and *snehana* of *sandhis* and pacify *vata* [12]. According to modern science, in trans rectal route; the rectum has a rich blood and lymph supply and drugs can cross the rectal mucosa like other lipid membrane and by entering general circulation, basti acts on whole body. Basti may block neuromuscular transmission by binding to acceptor sites on motor or sympathetic nerve terminals, entering the nerve terminals, and inhibiting the release of acetylcholine.

Abhyanga (massage) acts on muscles and makes them strong. The root of *mamsavaha srotas* is *snayu, twak* and r*aktavahini*. It may thus nourish the superficial and deep muscles and make the muscles strong and joints stable. *Abhyanga* (massage) has got facilitatory and inhibitory effects on motor system. At motor end plates acetylcholine acts as transmitter in the presence of Calcium ion and facilitates synaptic action potential. The nerve fibers have a myelinated sheet with lipids as the chief ingredients. The association of melatonin causes pleasantness and calming effects in the process of *Abhyanga* (massage) the toxins that are settled in the nerve fiber or myelinated sheet and interrupting the conductivity of the nerve impulse are drained out by the exertion of physical pressure on peripheral nerve endings, especially motor and also sensory. *Swedana* is *sthambhagna*, *Sandhichestakar, Srotoshuddhikar, Kaphavata Nirodhana*. Thus by its action the *Sroto sanga vighatana* may take place and stiffness of the joints relieved [13].

CONCLUSION

Matra basti and *Abhyanga* are effective in treating spasticity. *Matra Basti* has shown long term effect over reducing spasticity whereas *Abhyanga* and sweda are beneficial temporarily. *Suddha Bala taila* is effective in treating *Ekanga vata*, *Pakshaghata* and other related *Vataja vyadhis* as attributed to its *Rogaghnata*. Addition of standard control (physiotherapy) group in future clinical studies can be beneficial for better evaluation and comparison of Ayurvedic treatment modalities.

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STUDY PHOTOGRAPHS

Figure 1: *Bala* (Sida Cordifolia)

Figure 2: pulverized material

Figure 3: *Bala kasaya*

Figure 4: *Taila paka*

Figure 5: *Abhyanga*

Figure 6: *Basti* Materials