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COMPARATIVE STUDY OF VAAYU MUDRAA VS RIITESH MUDRAA FOR CONTROLLING SPASTICITY, DROOLING, GAIT AND VOLUNTARY URINE CONTROL IN CEREBRAL PALSY

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ABSTRACT

Cerebral palsy (CP) refers to a group of neurological disorders that, because of brain damage, impairs regular body movements and coordination due to loss of motor and other nerve function. CP is also known as spastic paralysis or Paralysis-spastic which was previously known as Little's Disease is caused by injuries to the cerebrum (the most significant part of the brain), which may occur as the baby grows in the womb or near the time of birth or due to internal injury up to the age of three. CP leads to impaired body movement and muscle coordination which deteriorate with age and affect normal livelihood. In the present study, a total of 21 healthy and 42 CP affected persons were subjected to perform Vaayu mudraa or Riitesh Mudraa for three months. Half of the persons from CP group practiced Vaayu mudraa and another half Riitesh Mudraa for 45 minutes per day. Pulse rate, walking speed, drooling and voluntary urine control was recorded at 0th day and 90th day of the treatment. Data have shown that, as compared to CP persons who practiced Vaayu Mudraa, CP patients who practiced Riitesh Mudraa showed significantly ($P<0.01$) lower pulse rate, improved walking speed (spasticity), drooling, gait and voluntary urine control. Thus, from this study, it can be concluded that Riitesh Mudraa can be a suitable alternative therapeutic tool for the CP persons as a replacement of hard exercises for the betterment of healthy performance of usual habit and livelihood.

Keywords: Cerebral Palsy, Vaayu Mudraa, Rittesh Mudraa, Spasticity, Naturopathy, Ayurvedic Acupressure

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1. INTRODUCTION

At present era, almost ten percent of the global population is suffering from some form of disability due to different causes. Cerebral palsy (CP), a most common motor disability in childhood, is one of the forms (Capute and Accardo, 2008). World prevalence estimates of CP is from 1.5 to more than 4 per 1,000 live births or children of a defined age range (Winter et al., 2002; Bhasin et al., 2006; Paneth et al., 2006; Arneson et al., 2009). However, in India, precise data is not available, but it is expected that prevalence of CP is 0.33%, means 3.3 per 1000 live birth. It is nearly 15-20% of the total physically disabled children have Cerebral Palsy (CP). However, India is a developing country; the actual figure

may be very must higher than expected. If we really go on statistical information on personal survey data, in India, almost 25 lakh children are suffering from CP (Kathy, 2010).

I mid 1800s a British surgeon first identified CP William Little then called 'Cerebral Paralysis' which then changed to 'Cerebral Palsy'. Here the term Cerebral refers to the brain and palsy- the loss or impairment of motor function. William Little, when he identified CP, raised the possibility of birth asphyxia during difficult birth as a chief cause of this disorder. However, a letter on, Sigmund Freud, in 1897, suggested that difficult birth not be the only cause but rather only a symptom of other effects on fetal development. So, in one word, CP refers to a group of neurological disorders caused by damage to or abnormalities in the developing brain that appear in infancy or early childhood and permanently affect body movement and muscle coordination. CP is also known as developmental disabilities which may lead to mental retardation, communication disorders, learning disability, attention deficit hyperactive disorder and childhood autism. These may occur singly or in combination as multiple disabilities.

CP has multiple etiologies during the antenatal, natal and in the postnatal stages. During pregnancy, intrauterine infections are accountable in some of the cases which can lead to impaired development or malformation of the brain. It is well established that, prenatal damages are responsible for approximately ten percent of the CP cases. However, genetic factors contribute to only 2% of the reported cases. Asphyxia, especially a prolonged one, occurred during difficult birth, increases the risk of CP and contributes almost 10% of the reported cases. However, premature birth or pathological lesions like periventricular haemorrhage, CNS infections, meningo encephalitis, hyperbilirubinemia, CVS accidents and head trauma and venous infarcts can also cause CP.

According to recent data, there is 1 in 250 affected with CP (Cdc.gov). In patients with CP, parts of the brain areas receive lower levels of oxygen (hypoxia) at some point resulting in the death of neurons (Larson et al., 2014). Premature infants have a slightly higher rate of cerebral palsy. Cerebral palsy can also occur during early infancy because of illnesses (encephalitis, meningitis, herpes simplex infections, and so on), a head injury that results in a subdural hematoma, blood vessel injuries, and many other conditions. It is not a disease in the strict sense of the word and hence is not contagious or hereditary. Although CP is a non-progressive condition where with the passage of time damage to the brain does not worsen, the effects of cerebral palsy may change.The classical finding of CP is increased muscle tone spasticity. This condition may either affect one side of the body (spastic hemiplegia), both arms and legs (spastic quadriplegia), one arm or leg, both legs (spastic diplegia).Also, the CP patient may have a partial or full loss of movement (paralysis), problems hearing and vision, and sensation abnormalities. Speech problems are common in persons with CP. The intellectual function may range from extremely bright ordinary to severe mental retardation. Symptoms of CP usually appear before the age of two. In severe cases, they may appear as early as three months of age.

Classifications of cerebral palsy include spastic, dyskinetic, ataxia, and mixed. Spastic cerebral palsy is the most common type. Whereas, dyskinetic (athetoid) cerebral palsy involves of abnormal twisting and jerking movements. When symptom involves tremors, unsteady gait, loss of coordination and abnormal movements is a condition of Ataxic cerebral palsy. In the case of mixed cerebral palsy it shows any combination of symptoms like irregular breathing, seizures, muscle contractions, difficulty sucking or feeding, delayed development of motor skills, such as reaching, sitting, rolling, crawling, walking, and so on.

Until the present day, there is no specific cure for cerebral palsy. The goal of all forms of treatment is tomaximisethe independence of an individual. In most of the time, symptoms exhibited by the individuals guide the treatment of CP. The treatment may include physical therapy, braces, appropriate glasses and hearing aids, medications, special education or appropriate schooling, and, in severe cases, institutionalisation.

2. INTRODUCTION TO MUDRAAS

In the Vedas it is said Naasti Mudraaasamam kinchit siddhiyamshitimandte,,meaning in this world, there is no method other than Mudraa to gain success. It is said in Indian Hindu- Vedas that our palms are very powerful and they have healing powers. It is well evident in holy Atharvaveda shlokas Ayam mehasto Bhagavan, nayammebhagavattarah I;

Ayam mevisvabheshajah, yam shivabhimarshanah ∏(-Atharvaveda 4.13.6). Means, fortunate is my left hand, yet more fortunate is right. Left hand contains all healing balms and removes blocks in the free flow of joy, and right makes whole with a gentle touch. For it contains all the medicinal capacities of the universe, it is all healing touch bringing peace, harmony, joy and liberation from all toxic conditions of matter, birth, death, old age and disease.

Hasta Mudraa or Ayurvedic Acupressure is a hand gesture or seal which is a symbol of energy and influence various body parts. Hasta Mudraa is the most beautiful form of expression using thumb and fingers. Hasta Mudraa works as a therapy for the body and mind by balancing the ratio of five elements (Panch Tattvas). Human palms have more than 5000 nerve endings. Whenever Hasta Mudraas have practiced these nerves ending get activated and thus activating corresponding brain part. Hasta Mudraas is a pure yoga that can be easily understood and practiced even by children. Vaayu Mudraaa is one of the ancient forms of Hasta Mudraa. Apart from this, the author is a person affected with postnatal CP developed another novel form of Hasta Mudra named Riitesh Mudra. Author practiced Riitesh Mudra on himself and got surprising results on improvement in routine daily work and responsibility. Despite severe effects of CP symptoms, the author has completed Diploma in Naturopathy (ND) and working as a state government servant at India. So, for the betterment of other persons like him, he prescribed ancient Vaayu Mudraa to one group and Riitesh mudraa to other group and collected data for the change in efficiency of daily natural activities like controlling spasticity, drooling, gait and voluntary urine control. As Hasta Mudraa is a form of naturopathy; this study may be a hallmark for the identification of suitable physiotherapy for the betterment of the person affected from CP.

3. MATERIALS AND METHODS

The present study was conducted in a total of 63 persons, aged between 35-65 years, located indifferent Indian cities. The study was conducted from a period of January 2012 to December 2015. Out of 63 persons employed in the experiment, 42 were suffering from CP and 21 were normal. The written consent was taken from all the people after explaining the study protocol. The persons with Cerebral Palsy were grouped into two. One group was asked to practice Vaayu Mudraa (Fig-1a; Fold the index finger (forefinger) on the pad of thumb. Press the forefinger gently on the pad. Press index finger with thumb. Keep the other fingers aloof. try with both hands) and other was asked to perform Riitesh Mudraa[Fig-1b; Fold the index finger (forefinger) on the pad of thumb. Press the forefinger gently on the pad. Press index finger with the thumb. Join the tip of thumb at a P9 point on the middle finger. Keep the other fingers aloof. Try with both hands] for 30 minutes two times in a day for 90 days.

Peoples on the study were also advised to record necessary parameters on a daily basis. Before recording the parameters, the peoples were advised to relax for at least 20 minutes. After the end of Mudraa practice of 90 days, they were asked to fill the online questioner on www.surveymonkey.com to explain the effect of Vaayu or Riitesh Mudraa on pulse rate, controlling spasticity, drooling, gait and voluntary urine output. The pulse rate was measured using Oximeter. The obtained data were statistically analysed with paired t-test using MS office 2010 software between Vaayu and Riitesh mudra practicing groups. Means with a difference at $p<0.05$ was considered as statistically significant.

4. RESULTS AND DISCUSSION

The data from forty-two Cerebral Palsy subjects who practiced Vaayu Mudraa and Riitesh Mudraa for 90 days were analyzed. The results obtained are expressed as Mean±Standard deviation (Table-1). The mean pulse rate of CP people, before practicing Vaayu Mudraa, was 123.71+2.97 and the mean pulse rate of subjects who practiced Riitesh Mudraa was 121.57.06+3.61. After 90 days of Vaayu Mudraa practice the pulse rate of the group who practiced Vaayu Mudraa was reduced to114.81+3.17 and that of who practiced Riitesh Mudraa was 100.43+3.15. This was a highly significant reduction of the pulse rate of Riitesh Mudraa ($p<0.01$) in comparison to Vaayu Mudraa ($p<0.05$) as shown in Table-1. In our study, it was found that, as compared to practicing Vaayu Mudraa for 45 minutes for 90 days with both hands between 2:00 pm to 6:00 pm, practicing Riitesh Mudraa, showed significantly reduced pulse rate. Similarly, the mean resting heart rate before practicing was 121.57 which was reduced to 109.1 in Vaayu Mudraa and 100.43 in Riitesh Mudra. Thus Riitesh Mudraa was found to be much more effective in reducing spasticity as compared to Vaayu Mudraaa and thus helping him to lead ahealthy life. After practicing Riitesh Mudraa and Vaayu Mudraa for 90 days on individual CP persons, the persons who practiced Riitesh Mudraa had better gait and urine control and less to nil drooling over

persons who practiced Vaayu Mudraa. In our study, we have also developed a new method of holding a pencil for persons with Cerebral Palsy and name it as Riitesh's Method of Holding Pencil (Fig-2).

In India, there are more than 26lakhs affected with Cerebral Palsy (Cerebral Palsy First Step, IFCP, Hyderabad). Anti-spasmodic drugs have an adverse effect on health. Children with poor control of mouth and pharynx muscles have drooling. This can cause severe skin irritation and cause to further isolation of affected children from their peers. Lots of drugs are available which can reduce the flow of saliva but may cause mouth dryness and poor digestion. Urine incontinence is caused by faulty control over the muscles that keep the bladder closed. The child may wet the bed, leak urine during physical activities or spontaneously (The Help Guide to Cerebral Palsy, global-help.org). However, antispasmodics are well-tolerated in an individual with CP, but it has serious side effects like heartburn, constipation, dry mouth (Xerostomia), involuntary muscle contraction (tremor), penis erectile dysfunction, difficulty passing urine, seizures and anaemia. It is interesting to note that pharmacological management of CP needs to take medicines on a routine basis. This causes a substantial economic burden to the individual if not in a condition to earn money. Apart from significant side effects of medicine, taking medicine builds an emotional and psychological stress. The most challenging face of pharmacological management of CP is for medicine CP individual need to be dependent on other individuals for availability medicines for them.

The pharmacological drug can have reduced the symptom but contributes to substantial psychological, emotional and economic loss to CP person or family, and the person remains independent for someone to bring the medicines for him. Certain effective supplements such as yoga, Mudraa, Pranayama is required for persons with CP. It is well evident in Hindu mythology that Mudraa, asana and Pranayama improve the physical, mental and spiritual health. Hand Mudraa and Pranayama are inexpensive, non-pharmacological techniques without any side effects. Further, any person with Cerebral Palsy can do it quickly at any stage of life, with little training. Mudraas or hand gestures have originated Indian tradition of yoga thousands of years ago. Regular practice of Riitesh Mudraa can reduce the spasticity at a faster speed as compared to Vaayu Mudraa in persons with Cerebral Palsy thus helping them to live a healthy life. Taking into consideration, the safety and efficacy of Mudraa, this study was done to observe the additional effect of yoga hand Mudraa on persons with Cerebral Palsy. Further medical studies need to be done for evaluation of this Mudraa for the benefit of humanity.

Fig-1

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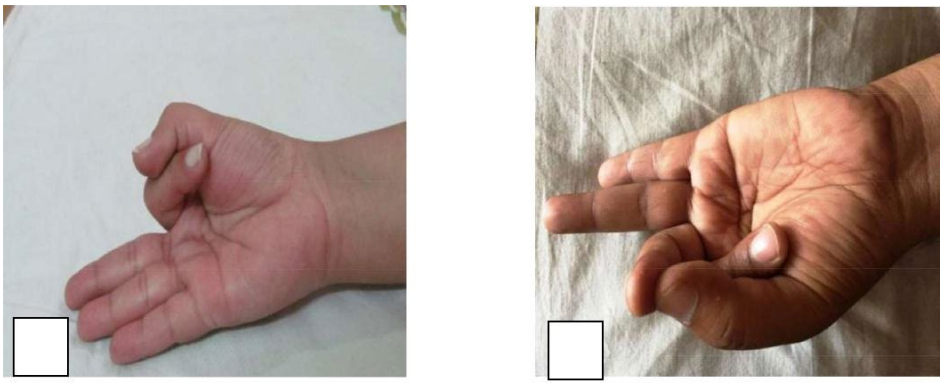

A **B**

Fig-1. A unique way to practice hand mudra. A. Vaayu mudraa-Fold the index finger (forefinger) on the pad of the thumb. Press the forefinger gently on the pad. Press index finger with the thumb. Keep the other fingers aloof. B. Riitesh Mudraa-Fold the index finger (forefinger) on the pad of the thumb. Press the forefinger gently on the pad. Press index finger with the thumb. Join the tip of thumb at aP9 point on the middle finger. Keep the other fingers aloof. Try with both hands.

Fig-2

Fig-2. Rittesh way to holding a pencil (Fold the index finger (forefinger) on the pad of the thumb, hold a pencil in index finger and thumb are in vaayu mudra position).

Riitesh's Law of Riitesh Mudraa
Principle:
Riitesh's Law states that the consistent practice of Riitesh Mudraa, a specialized hand gesture, can bring about a measurable and significant reduction in neurological symptoms such as spasticity, involuntary muscle control, and autonomic dysfunctions (like drooling and urinary incontinence) in individuals with cerebral palsy and other brain related issues.

Core Elements:
Neurological Regulation: Riitesh Mudraa operates by harmonizing the flow of bioelectrical energy in the nervous system, leading to improved neuroplasticity and motor function control.

Autonomic Balancing: The mudra helps balance the autonomic nervous system, particularly by enhancing parasympathetic activity, which can reduce symptoms such as drooling and incontinence.

Muscle Relaxation: Through consistent practice, Riitesh Mudraa can alleviate spasticity by promoting muscle relaxation and improving voluntary muscle control.
Mind-Body Connection: The mudra strengthens the connection between mind and body, fostering a state of focused relaxation that supports overall neurological health.

Application:
The law suggests that daily practice of Riitesh Mudraa, integrated with a holistic therapeutic approach, can yield significant improvements in patients with cerebral palsy.

Table-1

Table-1: Effect of yoga hand Mudraa on persons with Cerebral Palsy (MAS-Modified Ashworth Scale, 0-healthy to 4- clinical condition). Values with different letters (a,b) in rows and (X,Y) in columns are significantly different.

Variable		Before Mudraa	After90 days of practising Mudraa	p-value
Pulse Rate (bits/min)	Riitesh Mudraa	121.57±3.61	100.43±3.15	p<0.01
	Vaayu Mudraa	123.71±2.97	114.81±3.17	p<0.05

Spasticity reduction (MAS)	Riitesh Mudraa	4^{a}	1^{bX}	p<0.01
	Vaayu Mudraa	4^{a}	2^{bY}	p<0.05
Drooling symptom in no. of persons	Riitesh Mudraa	21^{a}	3^{bX}	p<0.01
	Vaayu Mudraa	21^{a}	15^{bY}	p<0.05
Gait symptom in no. of persons	Riitesh Mudraa	21^{a}	3^{bX}	p<0.01
	Vaayu Mudraa	21^{a}	9^{bY}	p<0.05
Involuntary urination in no. of persons	Riitesh Mudraa	21^{a}	3^{aX}	p<0.01
	Vaayu Mudraa	21^{a}	12^{bY}	p<0.05

CONFLICT OF INTERESTS
None

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