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# Efficacy of Brahmi in Cognitive Function – A Comparison between Cerebral Palsy Children and C.V.A Patients

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**ABSTRACT:** Cerebro-vascular accident or brain attack is the sudden loss of neurological function caused by an interruption of the blood flow to the brain. Cerebral palsy is characterized by the inability to normally control motor functions, which affect the child's ability to explore, speak, learn, and become independent. The aim of the study is to study the efficacy of Brahmi in cognitive function in C.V.A and cerebral palsy patients with behavioral problems. The scales being used in this study are- Positive and negative affect schedule, Psychological well being scale, Barthels index, FIM scale. Experimental study for a duration of 4-6 Months with convenient sampling was conducted in Mumbai among Chronic C.V.A patients and Cerebral palsy kids with behavioral problems of 30 subjects each. Results show that, Brahmi improves the cognitive function in CVA and Cerebral Palsy patients with behavioral problems. On comparison between the two Cerebral Palsy patients benefit more.

**KEYWORDS:** Brahmi; Behavioral problems; Cerebral Palsy; C.V.A; Barthels Index.

### I.INTRODUCTION

Cerebro-vascular accident or brain attack is the sudden loss of neurological function caused by an interruption of the blood flow to the brain. Brain cell function requires a constant delivery of oxygen and glucose from the blood stream (Sims NR et al, 2009). WHO 2012 defines "CVA" as a rapidly developing clinical signs of brain function due to disruption of focal or global with symptoms that lasted for 24 hours or more and can cause death, without any other cause other than vascular. Blood flow can be compromised by a variety of mechanisms usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients, causing damage to brain tissue causing brain cells to die (Sullivan et al, 2007). A CVA is also called, brain attack, cerebral infarct or C.V.A (Barnett et al, 1998). CVA due to infarct is the most common type, affecting about 80% of individuals with CVA, and results when a clot blocks or impairs blood flow, depriving the brain of essential oxygen and nutrients. Hemorrhagic CVA occurs when blood vessels rupture, causing leakage of blood in or around the brain.

It is the second commonest cause of death and forth leading cause of disability worldwide. Approximately 20 million people each year suffer from CVA and of these 5 million do not survive. In developed countries CVA is the first leading cause of disability, second leading cause of dementia, and third leading cause of death. CVA is also a predisposing factor for epilepsy, falls and depression in developed countries and is a leading cause of functional impairments, with 20% of survivors requiring institutional care after 3 months and 15%-30% being permanently disabled. The prevalence of C.V.A in India varies in different regions of the country and ranges from 40 to 270 per 1,00,000 population <sup>6</sup> The incidence of CVA is about 1.25 times greater for ,males than females. The major cost or impact of a CVA is the loss of independence that occurs in 30% of survivors (Dexter Morris et al, 2000) .For some

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individuals what was self sustaining and an enjoyable lifestyle prior to the CVA, may lose most of their quality of life after the CVA( Dalal PM et al, 2006)

“Psychology” is the science of human and animal behavior, which includes the application of this science to human problems. “Behavior” is the definition of psychology includes anything a person or animal does that can be observed in some way (Lim C Alexander et al, 2009) .In depression, patients always describe grief coming in waves, washing over them and subsiding. Even in intense situations, moments of light heartedness and happy reminiscence are possible. Many people survive CVA feel fear, anxiety, frustration, anger, and sadness and a sense of grief for their physical and mental losses. These feelings are a natural response to the psychological trauma of CVA. Some emotional disturbances and personality changes are caused by the physical effects of brain damage. Clinical depression which is sense of hopelessness that disrupts an individual’s ability to function, appears to be the emotional disorder most commonly experienced

by CVA survivors. Signs of clinical depression include sleep disturbances, a radical change in eating patterns that may lead to sudden weight loss or gain, lethargy, social withdrawal, irritability, fatigue, self loathing and suicidal thoughts. Post C.V.A depression can be treated with anti depressants and medications and psychological counseling. The emotional experience in CVA patients occupies the attention of many medical professionals. Emotion derives from basic drives such as feeding, reproduction, pain, fear and aggression (Robinson RG et al, 1981) .Therapeutic interventions to improve sensorimotor performance after C.V.A vary considerably (Duncan P et al, 1997)

### CEREBRAL PALSY

Cerebral palsy (CP) is one of the most common causes of disability in childhood, leading to functional limitations. It is characterized by the inability to normally control motor functions, which affect the child’s ability to explore, speak, learn, and become independent. Effective management can improve the quality of life for the child and family. Cerebral refers to the cerebrum, which is the affected area of the brain; palsy refers to disorder of movement. Cerebral palsy was first described by William John Little, an orthopedic surgeon in 1862 and initially was called Little’s disease who observed that children with tone and developmental abnormalities often have had prolonged labor, prematurity or breech delivery. Later, in 1897, Sigmund Freud suggested that Cerebral palsy might be rooted in the brain’s development in the womb and related aberrant development of factors influencing the developing fetus.

According to Michael V. Johnston (2008) 1 “Cerebral palsy is a diagnostic term used to describe a group of motor syndromes resulting from disorders of early brain development. Although it has been considered a static encephalopathy, but term is not entirely accurate because of the recognition that the neurologic features of cerebral palsy often change or progress over time”. Clayton L. Thomas describes cerebral palsy as “An umbrella term for a group of non-progressive, but often changing, motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development. Cerebral palsy is a symptom complex rather than a specific disease”. OP Ghai states that Cerebral palsy is a non-progressive neuro-motor disorder of cerebral origin, (Karam singh et al, 2012)

Management of CP in children requires multidisciplinary approach. Physiotherapy is accepted worldwide as standard for rehabilitation procedure. Medical management of spasticity, seizures etc. are associated with minimal effects. (choudhary kuldeep et al, 2014)

Cognition is the ability of a person to think matters out by using information from the brain. Because Cerebral Palsy is essentially caused by damage to the brain, the centers that transmit accurate information from several sources may be impaired. Some of the brain’s functions that fall under cognition include: Attention span, Comprehension, Decision-making, Difficulty processing emotions and feelings, Language skills, Learning, Memory, Problem-solving, Recognition, Speech proficiency. **Socialization of a child is something that is typically a natural phenomenon, but**

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**for children with disabilities, making friends and forming relationships can be especially challenging.** The benefits of socialization for a person with Cerebral Palsy can be life-altering and life-sustaining. Socialization experiences provide children the opportunity to learn from one another and develop important life skills and friendship bonds. Values, societal norms, and cultural guidelines are learned through a lifelong process of interaction with others. Socialization combats isolationism. Lack of socialization may adversely affect a child's social abilities, emotional health, learning, and individual well-being. (Marie Brossard-Racine et al, 2011)

Since there is scarcity of research done on the effects of the ayurvedic prescription of Brahmi and none were done on CVA and cerebral palsy patients with behavioral problems, hence this thesis , is conducted to study the efficacy of Brahmi on CVA patients and cerebral palsy patients with behavioral problems.

## II. AIMS AND OBJECTIVES

### AIM-

To study the efficacy of Brahmi in cognitive function in C.V.A and cerebral palsy patients with behavioral problems.

### OBJECTIVES-

1. To study the efficacy of Brahmi in CVA and Cerebral Palsy patients with behavioral problems.
2. To compare the efficacy of Brahmi between C.V.A and Cerebral palsy patients.

### The scales being used in this study are-

1. Positive and negative affect schedule.
2. Psychological well being scale.
3. Barthels index
4. FIM scale.

## III. MATERIAL AND METHODOLOGY

**Study Design:** Experimental study with convenient sampling.

**Study setting:** Mumbai

**Population of study:** Chronic C.V.A patients and Cerebral palsy kids.

**Sample size:** 30 subjects

**Sampling method:** Random sampling

**Inclusion criteria:** CVA patients and Cerebral Palsy kids with behavioral problems.

**Exclusion criteria:** Un- co-operative patients.

**Duration of study:** 4-6 Months

**Materials and tools:** Brahmi, Scales-

1. Psychological well being scale
2. Barthels index
3. Positive and negative affect schedule
4. FIM scale

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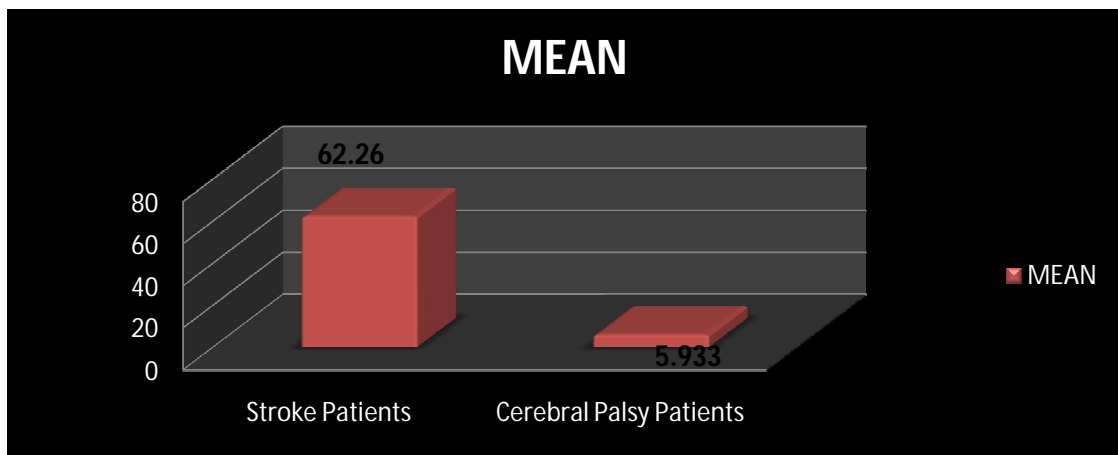
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## IV. DATA ANALYSIS AND INTERPRETATION

GRAPH 1 –

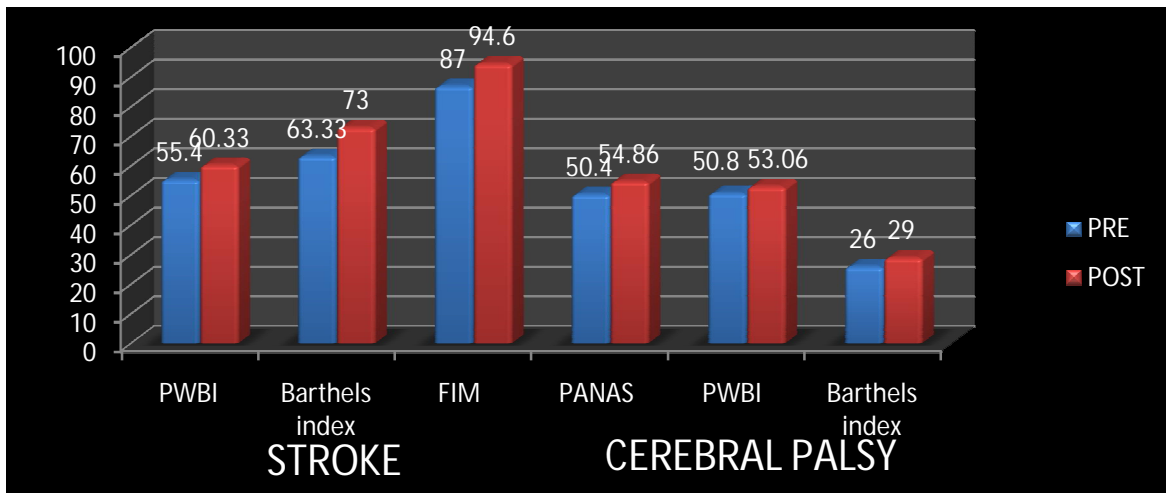
	AGE	
	Mean	Standard Deviation
C.V.A	62.26	8.852
Cerebral Palsy	5.933	2.549



Interpretation:

Graph 1 shows the mean of age distribution among the study population.

GRAPH 2 –



Interpretation:

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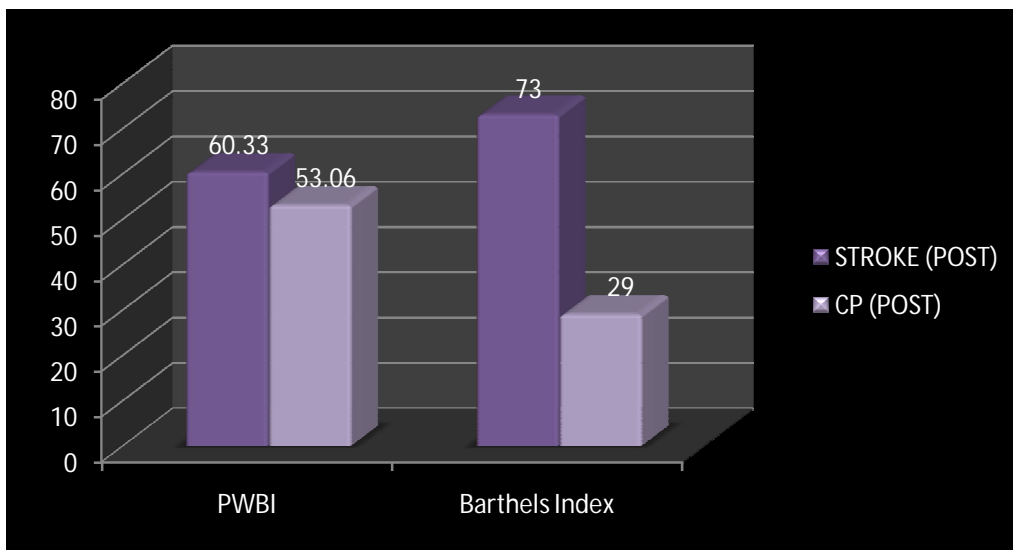
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Graph 2 shows the mean pre and post, values of PWBI, FIM, and Barthels index scales for C.V.A patients and PANAS, Barthels index, and PWBI for Cerebral palsy children respectively.

GRAPH 3:



Interpretation:

Graph 3 shows a comparison between the post -treatment mean values for PWBI and Barthels index respectively.

## V. DISCUSSION

This study was carried out to compare the Efficacy of Brahmi on C.V.A and cerebral palsy patients with behavioral problems. Patients were distributed samples of Brahmi tablets and were instructed to be taken for about 1 month period. They were explained about the benefits and the side-effects of the medicine and they were also required to fill a consent form for the same. It was carried out in 2 groups, Group 1 included 15 C.V.A patients and Group 2 included 15 Cerebral Palsy children with behavioral problems. The study comprised of group 1 which included 1-15 C.V.A patients (13 men and 2 women) with a mean age of 62.26, and group 2 comprised 16-30 Cerebral Palsy children (10 male and 5 female) with a mean age of 5.93.

In this study it was observed that, in Group 1 which comprised of 15 C.V.A patients, there was a significant increase in the scores of Barthels index and FIM scales, and no statistically significant difference in the scores of Psychological wellbeing index (PWBI) after an intervention of 4 weeks. An increase in the score of Barthels index and FIM scale means that an improvement was seen in the daily living activities of patients and their functional independence. Psychological wellbeing index (PWBI) measures 6 dimensions : Autonomy, Enviromental mastery, Personal growth, Positive relations with others, purpose in life and self acceptance. Higher scores on each dimension on scale indicates Greater well being. Not quite significant score of PWBI indicates, not significant improvement in the mental status of the patient.

In Group 2, that included 15 Cerebral Palsy patients, there was a significant increase in the scores of PWBI and Barthels index and significant increase in the scores of Positive and negative affect schedule (PANAS) after an intervention of 4 weeks. An improvement in the score of PWBI on each dimension on scale indicates Greater wellbeing of the patient. An increase in the score of Barthels index means that an improvement was seen in the daily living

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activities of patients and their functional independence. PANAS is one of the most widely used scales to measure mood or emotion. This scale measures General distress and dysfunction, depression, and state anxiety are more highly correlated with the Negative affect scale than the positive affect scale. Also, significant increase in the Positive dimensions of PANAS scale indicates Greater well being in the mental health of the patient.

Evidence suggests that standardized extracts of *B. monnieri* have potential for safely enhancing cognitive performance in aging, an indication that is closely comparable to the traditional uses of the herb. Whether this effect is due to a direct mechanism in which the active agents in *B. monnieri* act upon brain chemistry to influence memory processes or to greater tolerance for frustration, or due to decreasing the performance-degrading effects of arousal on complex tasks, or yet some other mechanism, remains to be explored. (Carlo Calabrese et al, 2008) Brahmi is believed to cause a faster recover of muscle action potential in response to neuromuscular stimulation. Thus, causing a faster functional recovery. Brahmi serves as a neuro tonic. In the ischemic brain Brahmi reduces the infarct size. It decreases nitrite, nitrate and lipid peri-oxidation. The extract of Brahmi protects neurons from beta-amyloid-induced cell death. The neuro protective activity of Brahmi is due to its ability to suppress cellular acetylcholinesterase activity (De k et al, 2008).

It was seen in this study that, the PWBI scores in C.V.A patients showed statistically lesser significant improvement compared to Cerebral Palsy patients. Psychological wellbeing index (PWBI) measures 6 dimensions: Autonomy, Enviromental mastery, Personal growth, Positive relations with others, purpose in life and self acceptance. Higher scores on each dimension on scale indicates Greater well being. The main objective of PWBI is to measure self representations of intrapersonal affective or emotional states reflecting a sense of subjective wellbeing or distress. (McKee-Ryan et al 2005) Brahmi and medicines play an important role in the psychological improvement of the patient. And hence it was seen in the study, that Brahmi proved to be beneficial for the psychological improvement and overall wellbeing of the patient.

It was seen in this study that, Barthels index showed statistically significant improvement in both C.V.A and Cerebral Palsy patients after 4 weeks of intervention. An increase in the score of Barthels index means that an improvement was seen in the daily living activities of patients and their functional independence. Barthels index is an ordinal scale used to measure performance in activities of daily living. The Barthels index signifies one of the first contributions to the functional status literature and it represent physiotherapist's length period of inclusion of functional mobility and ADL measurement within their scope of practice. (Sullivan et al 2007)

It was also seen in this study that, the Functional Independence Measure scores showed statistically significant improvement for C.V.A patients. FIM is a basic indicator of severity of disability. The functional ability of a patient changes during rehabilitation and the FIM instrument is used to track those things. The rating scale designates major graduation in behavior from dependence to independence. The FIM scale is used to measure the patient's progress and assess rehabilitation outcomes. It includes dimensions like, eating grooming, bathing, dressing, toileting, transfers, bladder, bowels, and locomotion. This scale is useful in clinical settings of rehabilitation. The FIM has been used extensively in rehabilitation, including that for C.V.A and multiple sclerosis. Scores are responsive to change and also reflect the patient's discharge destination. ( R Katzman et al, 1983)

It was seen in this study that, there was a significant increase in the scores of Positive and negative affect schedule (PANAS) after an intervention of 4 weeks. An improvement in the score of PWBI on each dimension on scale indicates Greater wellbeing of the patient. PANAS is one of the most widely used scales to measure mood or emotion. This scale measures General distress and dysfunction, depression, and state anxiety are more highly correlated with the Negative affect scale than the positive affect scale. Also, significant increase in the Positive dimensions of PANAS scale indicates Greater well being in the mental health of the patient. The Positive and Negative Affect Schedule-Expanded version (PANAS) is a self-report measure of positive and negative affect developed by David Watson and Lee Anna Clark (1994) on the basis of earlier work, PANAS, by Watson, Clark, and Tellegen (1988) and has been one of the most widely used instruments to assess them. Positive Affect (PA) and Negative Affect (NA) are the most

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general dimensions that describe affective experience. Positive Affect (PA) reflects the level of pleasant engagement, the extent to which a person feels enthusiastic, excited or active. Negative Affect (NA) reflects a general dimension of unpleasant engagement that subsumes a range of aversive affects including guilt, fear, shame or nervousness. The positive and negative dimensions of trait affect have formed dependent, independent, or control variables in numerous studies within and across diverse cultural settings not only in psychology, but also in several disciplines outside of psychology. (Mariana Ispas Cotigă\* et al, 2012)

Thus as seen in this study we can finally conclude that, in C.V.A patients, FIM and Barthels index showed significant results, while PWBI didn't show quite significant results when compared to pre and post treatment results statistically. And also the same for Cerebral palsy patients, PWBI and Barthels index showed significant results in patients and PANAS showed significant results in Cerebral Palsy children on comparison to pre and post treatment results statistically. Also statistically, on comparison between C.V.A and Cerebral Palsy patients the effectiveness of Brahmi in improving their behavioral problems or improving their cognitive function we found that there is no much significant difference in the effectiveness of Brahmi for both, C.V.A and Cerebral palsy patients. It is equally effective as seen in the study in both groups. Brahmi and medicines play an important role in the psychological improvement of the patient. And hence it was seen in the study, that Brahmi proved to be beneficial for the psychological improvement and overall wellbeing of the patient.

As discussed earlier Brahmi plays an important role in improving the mental status of an individual. Physiotherapy also improves the Cognitive factors of an individual like, concentration memory and orientation. Thus it is seen in this study, that Brahmi responded the best for both C.V.A and Cerebral Palsy patients.

## VI. LIMITATIONS AND RECOMMENDATIONS

**LIMITATION** - The sample size is small..

**RECOMMENDATIONS**- Further study can be conducted with larger sample size and greater interventional period.

## VII. CONCLUSION

1. Brahmi improves the cognitive function in CVA and Cerebral Palsy patients with behavioral problems.
2. On comparison between Cerebral patients and CVA patients, Cerebral Palsy patients benefit more.

## IX. ACKNOWLEDGEMENT

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