ABSTRACT
Cerebral palsy is a static, non progressive perinatal encephalopathy manifested by abnormal control of movement and posture having additional disturbances of cognition, communication and behaviour. It is a leading cause of childhood disability affecting function and development causing physical, mental and social handicapped. In Ayurvedic texts various factors are described influencing the developing brain and also they have mentioned various precautionary measures and advises that should be followed. In Ayurvedic texts the cerebral palsy and its related features can be covered mainly under Vatayadhi. The main causes are Dauhrid Avamnamana (Not fulfilment of longings of the pregnant woman), Vata Prakopa during pregnancy, use of Garbhopaghatakara bhava, intake of Dusta stanya etc. There is no effective treatment for the underlying brain damage in cerebral palsy has been developed till today. Ayurveda, time tested life science having holistic approach for its management of all aspects and disorders of the life. In case of cerebral palsy it has various treatment modalities such as medicines like Medhya Rasayana to promote stamina of the brain and Panchakarma therapy like Snehan, Swedana, Nasya and Basti to reliving the spasticity and strengthening the muscles. So that it is necessary to review and promote the Ayurvedic system of medicine for the better management of cerebral palsy in children.

KEYWORDS: Cerebral Palsy, Ayurveda, Panchakarma, Bastikarma etc.

INTRODUCTION
Cerebral palsy is a static, non progressive perinatal encephalopathy manifested by abnormal control of movement and posture,[1] leading cause of childhood disability affecting function and development causing physical, mental and social handicapped. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, cognition, communication, perception, and/or behaviour, and/or a seizure disorder. Despite development of super specialized modern medical system the prevalence of cerebral palsy case are still increasing. In Ayurvedic texts various factors are described influencing the developing brain and also they have mentioned various precautionary and treatment measures and advises that should be followed. There is no effective treatment for the underlying brain damage in cerebral palsy has been formulated till today. The management of cerebral palsy involves to relieves stiffness of the muscles such as physiotherapy, speech therapy, occupational therapy and some stiffness removing drugs so that the affected child become able to perform their daily routine work but it is seen that these therapies are not sufficient for the management of cerebral palsy and there is extensive need to search better option for the management of such type of abnormalities. The management should be also focused on the improving of the function of brain damage.

Ayurveda, time tested life science having holistic approach for the management of all aspects and disorders of the life. In case of cerebral palsy Ayurveda has various aspect of treatment such as medicines like Medhya Rasayana to promotes stamina of the brain and Panchakarma therapy for reliving the spasticity and strengthening the muscles. So that it is necessary to review and promote the Ayurvedic system of medicine in the management of cerebral palsy.

TYPES OF CEREBRAL PALSY
Cerebral palsy is characterized according to affected part of the controlling brain and movement. The type of
movement in Cerebral Palsy patient depends upon severity of brain injury and its impact on muscle tone.

There are four major types of cerebral palsy.

1. **Spastic cerebral palsy**
   - It is caused due to damage of motor cortex and pyramidal tract of the brain. In this type of CP the simple tasks such as walking or holding up small objects becomes more challenging. There is also some coexisting condition like ADHD and epilepsy are present. According to muscle stiffness affected area, spastic CP can be subtypes as spastic diplegia, spastic hemiplegia or spastic quadriplegia.

2. **Athetoid cerebral palsy**
   - It is also known as dyskinetic cerebral palsy, caused due to damage to the basal ganglia or cerebellum or both. Basal ganglia co-ordinate voluntary movement and helps to regulate thinking and learning while cerebellum is essential for balance and fine motor skill.

3. **Ataxic cerebral palsy**
   - There is impaired movement due to loss of motor coordination.

4. **Mixed type**
   - It contains features of all types of C.P.

   The cerebral palsy appears during infancy or preschool years. It produces following features-
   - Impaired movement associated with abnormal reflexes,
   - Floppiness or rigidity of the limbs and trunk,
   - Abnormal posture,
   - Involuntary movements, Bending arms or clenching fists unknowingly
   - Unsteady walking,
   - Toe walking,
   - Teddy bear pose (Keeping arms raised or suspended in airs)

   The early features of Cerebral Palsy are
   - Baby’s inability to lift his or her head by the appropriate age of development
   - Poor muscle tone
   - Stiffness in joints or muscles, or uncontrolled movement in a baby’s arms or legs.

   In these children there may be additional disturbances of cognition, communication and behaviour. Some having imaging abnormalities in the brain, such as focal infarction, brain malformations and periventricular leukomalacia however not all children with cerebral palsy have abnormal brain imaging and in such cases determining the cause is particularly challenging.[2]

**CEREBRAL PALSY ACCORDING TO AYURVEDA**

Since it is multifactorial and multi featured disorder so could not be correlated with any single disease or condition mentioned in Ayurvedic texts. According to Ayurvedic texts the cerebral palsy and its features can be covered under following diseases or conditions.

- **Phakka roga** (Nutritional disorder described in Kashyapa samhita)
- **Panigula** (Locomotor disorder),
- **Mukatva** (dumbness),
- **Jadatva** (mental disorders),
- **Ekāngaroga** (monoplegia),
- **Sarvāngaroga** (quadriplegia),
- **Pakṣaghāta** (hemiparesis),
- **Pakṣavadha** (hemiplegia),
- **Akshepaka** (convulsion disease)

All the above conditions are under the group of Vātavāyuḥdhi and the management should be planned according to diagnosis made by Ayurvedic diagnostic tools (Rogi- Roga Pareksh) such as Dosh, Dushya, Srotos, Adhisthana, Vyaktasthana, Prakriti, Asthavidha Pareeksha etc. According to Vagbhatta it can be included under Sahaja, Garbhaja and Jataja types of disorders.[3]

**CAUSES OF CEREBRAL PALSY**

This sporadic, non progressive, non contagious condition[4] having multiple aetiology but frequently considered to be caused by prenatal, natal, and postnatal insult producing injury to the developing brain especially by birth asphyxia.

In Ayurvedic texts following causative factors are described related to cerebral palsy or cerebral palsy like disorders-

- **Dauhrid Avamanana** (Not fulfilment of longings of the pregnant woman)[5]
- **Vata Prakopu** during pregnancy (aggravation of vata during pregnancy)[5]
- **Use of Garbhopaghatakara bhava** (dietary and behavioural regime causing foetal anamaly or fetal loss)[6]

These are[6]

- Use of Aritgura (very poor digestible food items),
- Atiushna (excessive Ushna/hot food items),
- Aiteekshna food items.
- Daruna Chesta (excessive hard work)
- Rakta Vastra Dharana (use of red cloths/cloths mixed with blood)
- Use of Madya(alcohol) or intake of Madakarak (drunkenness/intoxication producing) food item
- Yanamadhirohana (riding over especially excessive shaking)
- Intake of meat
- Use Sarvendriya Pratikula Ahara Vihara (diet or behaviour which are harmful for sensory organs)

- Not following proper Garbhini Paricharya (the optimum guideline followed during pregnancy as prescribed in Ayurvedic texts or others)[7]
- Incompatible Garbha Vriddhikara Bhava (factors responsible for fetal growth)- these are Matraja,
**Pitroja, Atmaja, Satmaja, Satvaja and Rasaja Bhava.**[8]
- Intake of Dusta Stanyam (vitiated mother milk) especially due to Tridosha or Vata Pitta in Vataipitta Prakriti mother[9]
- Akala Pravahana (producing force by the mother in inappropriate time during labour),
- Shiromarmabhighata (head injury),
- Not performing proper Prana Pratyagamana (neonatal resuscitation),
- Ulbaka roga (aspiration of amniotic fluid),
- Nabhı Nadi Vikara (diseases of umbilical cord), Graha Roga (infectious diseases),
- Improper Shishu Paricharya (not using proper neonatal/infant care).

**APPLICABLE PANCHAKARMA PROCEDURE IN THE MANAGEMENT OF CEREBRAL PALSY**

The management of cerebral palsy involves to relieve stiffness of the muscles that are physiotherapy, speech therapy, occupational therapy and some stiffness removing drugs so that the affected child becomes able to do his/her daily routine work but it is seen that these therapies are not sufficient for the management of cerebral palsy patient and there is extensive need to search better option for the management of such type of abnormalities.

Ayurveda is very old but gold, time tested life science for the management of all aspects and disorders of the life. In case of cerebral palsy it has various aspect of treatment such as medicines, Panchakarma therapy etc. The line of management of cerebral palsy should be Vatashamaka (pacifying Vata Dosha) and Medhya (Intellect promotor). The following Panchakarma procedure described in Ayurvedic texts are beneficial in the case of cerebral palsy.

**Snehana**
- Snehana is the process which impart Sneh, Vishiyanada(liquidity/solubility), Mardava and produces Kleda in the body.[10] Snehaka improves longevity, complexion, strength, nourishment, vitality etc. to the body and removes vitiated Dosha.[11] By the process of Snehaka Karma Snehaka is used externally as well as internally. Snehaka medicated with Medhya drugs nourishes, and act towards breaking the pathology that why beneficial for the brain. Snehaka used externally such as Abhyanga nourishes and removes spasticity of affected muscles in cerebral palsy patients. Snehaka pacifies Vata Vikara.[12] so can be used in case of cerebral palsy patients.

**Swedana**
- Swedana Karma is mentioned as Purvakarma of Panchakarma therapy, also beneficial separately in Paediatric practice. Induction of sweating for therapeutic purpose is named as Swedana in Ayurveda. It should be done after proper Snehana and alleviates stiffness, heaviness and coldness of the body.[13] Proper Snehana - Swedana removes spasticity of muscles in C.P patients. Shastrika Shali Pinda Sweda is known for its spasm reliving and nourishing property in cerebral palsy patients.

**Basti karma**
- Bastikarma is regarded as very special treatment modality among Panchakarma. Administration of medication through ano-rectal route is known as Basti. There is no any such delicate therapy (Sukhakar Chikitsa) beside Bastikarma[14] for the treatment of Shakkakostha, Sarvanga or Ardhanga Gata Roga because Vata plays a root cause for the production of these diseases[15] and Basti is the best procedure to pacify Vata.[16]

**Nasya Karma**
- The process in which drug administered through the route of nostrils is referred as Nasya Karma.[17] Acharya Charaka has mentioned Nasa (nostrils) as gateway of Shiraha (head/brain) so the drug administered through the nose as Nasyakarma reaches to entire Shira Pradesh through Sringaitaka Marma to eradicate the disorder of Urbhajatru caused by Vitiata Kapha (by Virechana Nasya) and Vata Dosha (cured by Snehana Nasya).[18] Especially Snehana Nasya should be used in case of cerebral palsy as it comes under Vata Vyadhi.[19]

**DISCUSSION**

Cerebral palsy can be considered under vataika disorder in Ayurveda so vatashamaka Panchakarma procedure should be done. In a study done by Sagar M et al, Total 8 patients of cerebral palsy were treated with 5 days of Udvartan, 5 days of Abhyanga followed by Sarvanga Swedana and then 8 days of Yoga Basti. In Yoga Basti 1 Anuvasana Basti in the beginning and then 3 set of Anuvasana and Asthapana Basti followed by 1 Anuvasana Basti at last were given. Bula Taila is used as Anuvasana Basti and Madhuratikaa Basti as Asthapana Basti. The same course has been repeated for 3 times with an interval of 14 days. during whole procedures as internal medication Asthanga Ghrita is used. The result showed good especially by improving growth and development, reducing spasticity of left upper limb and muscle spasm.[20]

In another study by Vyas A et.al which was carried out in 16 patients of cerebral palsy, 8 in each group, namely group A and group B . In group A Shasthika Shali Pinda Sweda externally and Samvardhana Ghrita internally and in group B only Samvardhana Ghrita was given as internal use for 35 days duration. In group A, moderate improvement, mild improvement, and no improvement were observed in 50%, 37.5% and 12.5% of patients respectively. In group B, moderate improvement and mild improvement were observed in 75% and 25% of the patients respectively. Statistical significance of results on selected criteria showed the efficacy of the selected Ayurvedic treatment modality in relieving the features of CP.[21]
An another study by U Shailaja et.al on CP patients of the age group 2-10 years were included and randomly divided into two groups. 40 cases of study group were treated with Mustadi Rajayapana Basti for 8 days, followed by oral administration of Baladi Yoga with honey and ghee for 60 days. Before administering Basti, Sarvanga Abhyanga and Sastikashali Pinda Sweda is given . In the control group of 40 patients tablets of Godhuma powder for 60 days is given. Before administering the placebo tablet, control group were given Sarvanga Abhyanga and Sastikashali Pinda Sweda for 8 days and Basti with lukewarm water for 8 days. The Rajayapana Basti and Baladi Yoga treated group showed the improvements in understanding ability (13.43%), speech (10%) and performance skill (11.11%), in fine motor functions such as putting small object in to a container (14.3%), throws the ball in all direction (21.8%), use of thumb and index finger (10.93%), retaining 2 inch cube in fist (19.04%), folds paper and inserts into envelope (10.30%), in gross motor functions such as in crawling (26.7%), sitting (31.7%), standing (13.75%), walking (9.5%) and claps hands (13.9%) respectively.[22]

A case study done by Sagar Mahendra bhinde also showed the positive result on CP patients. In this study 5 days Udavrtana with barley powder and horse gram powder for 20 minute daily, 5 days Abhyanga with Balalatai for 20 minute followed by sudation for 20 min and Caturbhadra Kalpa Basti (four Sneha Bastis to start with, followed by four Asthapani Basti and four Anuvasana Basti) and Astangaghrita 2.5 gm daily (Anupana with Luke warm water) throughout treatment schedule, except the days Basti was given. Anuvasana Basti is given with 30 ml lukewarm Balalatail and Asthapana Basti (120 ml) as Madhahitalika Basti. Such three courses were done with the interval of 14 days.[23]

CONCLUSION
In the recent era, in spite of developed medical science and its facilities in the world the case of cerebral palsy are still increasing. So there is need to review our medical system repeatedly. Still there is no effective treatment for the underlying brain damage has been formulated till today. The management of cerebral palsy involves to relieves stiffness of the muscles by the use of physiotherapy, speech therapy, occupational therapy and some stiffness removing drugs so that the affected child becomes able to do his/his daily routine work but it is seen that these therapies are not sufficient for the management of cerebral palsy patient and there is extensive need to search better option for the management of such type of abnormalities. The management should be also focused on the improving of the function of brain damage.

Ayurvedic science can provide a better direction by improving the quality of life of children with CP with better life expectancy. With the understanding and follow up of contemporary medical science there is extensive need to understand the old scientific, time tested Ayurvedic knowledge of Garbhini Paricharya, Garbhaviddhikara Bhava, Garbhapaghatakara Bhava, Stanyu Dusti and other related factor for the prevention of cerebral palsy and promotion of Ayurvedic remedied Medhya Ghrita and Panchakarma procedure such as Snehana, Swedana, Nasya and Bastikarma for the management of cerebral palsy.

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