ROLE OF DOSHAS IN THE PATHOGENESIS OF CEREBRAL PALSY - A VIEW

Gavali Kishor1, Preeti2, Agrawal Sachin3, Prasad Anjali Baijnath4, Kumar Abhimanyu5
1Research officer (Ayu.) RARIMCH, Nagpur
2Assistant Professor, Dept. of Rog Nidana & Vikriti Vigyana, VPAMC, Sangli
3Assistant Professor, Dept. of Rasashastra & Bhaishajya Kalpana, SGCAS, Sriganganagar, Rajasthan
4Research officer (Ayu.) CARIRD, Patiala
5Prof. Abhimanyu Kumar, Director, All India Institute of Ayurveda, Delhi

ABSTRACT:
Cerebral Palsy is an umbrella term commonly referred to as ‘C.P.’ and is one amongst the common paediatric neurological disorders described by loss or impairment of motor functions, caused by non progressive insult to brain. The brain damage is caused by brain injury or abnormal development of the brain that occurs while a child’s brain is still developing before birth, during birth, or immediately after birth. It is one of the common causes of severe physical disability in childhood. It is a challenge for Ayurvedic physicians to diagnose and treat such a big ailment on Ayurvedic lines due to non-availability of clinical entity named as Cerebral Palsy in classical Ayurvedic literature. The disease doesn’t exist by a particular name in Ayurveda but its sign and symptoms are definitely described by our Acharyas which are scattered here and there in different chapters of Ayurveda. Thus, this work is an effort to explore the involvement of different doshas viz. vata, pitta and kapha and its type involved in the pathogenesis of Cerebral Palsy. Amongst five type of each doshas Sadhaka Pitta, Pachaka Pitta, Shleshaka Kapha, Tarpaka Kapha and Mansika doshas Raja and Tama are vitiated and take part in the pathogenesis of C.P. along with all five types of vata.

Keywords: Cerebral Palsy, doshas, manasika doshas.

INTRODUCTION: Cerebral refers to the cerebrum which is the affected area of the brain (although the disorder most likely involves connections between the cortex and other parts of the brain such as the cerebellum) and palsy refers to disorder of movement. CP is caused by damage to the motor control centres of the developing brain. Cerebral Palsy features were identified pointing to antenatal factors causing abnormal brain development. CP is also commonly associated with a spectrum of developmental disabilities including mental retardation, epilepsy and visual, hearing, speech, cognitive, and behavioural abnormalities. It is a chronic motor disorder which affects body movement, muscle control, muscle coordination, muscle tone, reflex, posture and balance. Children with CP suffer from multiple problems and potential disabilities such as mental retardation, epilepsy, feeding difficulties, ophthalmologic impairments, hearing impairments, disturbances of sensation, cognition, communication problem, perception impairment, behavior disorders and by a seizure disorder. It can also impact fine motor skills, gross motor skills and oral motor functioning. The sign comprises of spasticity, movement disorders, muscle weakness, ataxia, and rigidity. In India, incidence of CP is recorded at around 3 cases per 1000 live birth and is a common cause of physical disability in childhood. In Ayurveda, there is no definite term given for the disease ‘Cerebral Palsy’. However, its clinical manifestation is certainly given in different chapters of Ayurvedic literature. According to Ayurveda, Cerebral Palsy is a Vata predominant vyadhi; however, sharirika doshas - vata, pitta, kapha and mansika doshas –Raja,
Tama are responsible for the manifestation of Cerebral Palsy. Cerebral Palsy is mostly a non progressive condition characterised by vitiating vata prakopa and kapha ksheenata. Vata dushti is predominantly by Margavarodha and/or Dhatuksaya. Role of different doshas and their types in manifestation of symptoms of cerebral palsy are described below.

Doshas and their types taking part in the pathogenesis of C.P. are Vayu, being the chief amongst doshas, governs the other two doshas i.e Pitta and Kapha. “Sarva Hi Chesta Vaten” i.e. all the body movements are caused by Vata. It stimulates and gives strength to all indriyas to receive only their relevant vishayas and leads the concerned resulted impulse of sangyan to mastishka through sangyavaha nadi. It controls different mechanism of body and generate various chestas (every voluntary / involuntary movements), so it is called as a Tantra Yantra Dhara. Praspadanam. Vayu keeps balance of Dosha, Dhatu and Agni, it leads all the function of body and mind (Buddhi karma) smoothly.

Kapha, Pitta, Malas and Dhatus are Pangu i.e. immovable without vayu. So vayu is responsible for their proper movement to their respective place. Thus, it can be stated that the activities of the nervous system, in all its aspects - the central, vegetative, peripheral including the autonomous can be identified with the concept of Vata. Vata controls and regulates the functions of brain and psyche. The main dosha involved in Cerebral Palsy is Vata dosha. All Vayus seem to be essential for the pathophysiology of Cerebral Palsy in unison. In the dysfunctioning of physical and mental processes, it works in unison with the help of other entities i.e. Sadhaka Pitta, Pachaka Pitta, Shleshaka Kapha & Tarpaka Kapha mainly. Description is given below:

Involvement of Vata dosha in Cerebral Palsy

(1) Prana Vayu

Sthana: Shira i.e. head, and Hridaya are stated as the seat of Prana vayu. Sanchari sthana is urah Pradesh where hridaya is also situated. Shira is chief working seat of the Prana Vayu. Shira is also stated as the seat of the Indriya and Indriya-Pranavaha srotasa. The Indriya-Pranavaha srotasas are the channels or the tracts which convey prana. The upaghata of specific Indriya-Pranavaha srotasa leads to specific Indriya upaghata.

Karma: Acharya charaka has explained the functions of Prana vayu as ssthivana, kshavathu, udgaara, shwasa, Annapravesh. After exertion, if one is opposing natural urge of extra air (shramashwasa vidharanat) then he will suffer from Gula, Hridroga and Samohaghata.

According to Sushruta, Pranavalabhan karma is also another function of Prana Vata. Acharya Vagbhata has stated four major function viz Buddhi dhara (to support), Indriya Dharana, Chitta Dharana and Hridaya Dharana. It regulates and governs the mana. It is responsible for inward movement of food from mouth to esophagus. One of the karma of Prana Vayu is stated as to support Dhamani. Acharya Sharangadhar has mentioned that Prana Vayu is responsible for inspiration and expiration.

(2) Vyana Vayu

Sthana: Main seat of the vyana vayu is hridaya.

Sanchari sthana: It circulates throughout the body for the function of rasa-rakta samvahana.

Karm: Acharya Charaka has described the functions of vyana vayu as Gati (movements), Prasarana (extension), Akshepa (convulsion), Unmesha - Nimesha (blinking). Hridaya contracts with the help of vyana vayu and perform yugpat vikshepana (simultaneous throw) of rasa-rakta continuously in the entire body.

Hence nourishment of all dhatus (tissues) takes place continuously and in circulatory fashion (parivruttistu chakravat), some
excretory products are also expelled out and thus homeostasis of body physiology is maintained. **Rasa dhatu** flows against gravity due to **vyana vayu** only. **Vyana vayu** performs the karma like Gati, Apkshepana, Urkshepana, Nimesh and Unmesha. **Vyana vayu** is involved in the regular cardiac activity and hence take part in the regulation of blood pressure. **Acharya Dalhana** in Sutrasthana 15th chapter implied that Praspadana (chalana of sharira) is the karma of vyana vayu. Thus, **vyana vayu** controls sympathetic nervous system throughout the body. All movements of the body both voluntary as well as involuntary are controlled by vyana-vayu. It can be represented by the autonomic as well as central nervous system which controls our body movements.

(3) **Udana Vayu**

**Sthana:** Main seat of Udana Vayu is Urasrthana it means that the organs present in Urasrthana are having the control of Udana Vayu.

**Karma:** Acharya Vagbhata enunciates the Karma of Udana Vayu are Vaka Pravritti (process of speech), Prayatna (efforts), Urja (Energy), Bala (Strength) and Varna (Complexion) and Poshana. Acharya Sushruta has mentioned its functions as Bhashita (Speech), Geeta (Singing) and Uchhavasa (Expiration). All these karma are performed in whole body. Udana provides strength and energy to all organs, directly or indirectly.

(4) **Samana Vayu**

**Sthana:** The site of samana vayu is Agnisamipya. Sweda, Dosha, Ambuvaha Srotas are also said to be its sites.

**Karma:** Acharya charaka has stated that it gives strength to Agni.

Acharya Vagbhata has said that it performs Dharana (to receive the food), Pachana (digestion), Vivechana (separation between useful and waste parts of anna) and Munchati karma. (takes kita to the lower part of the alimentary canal). Acharya Sharangdhara has stated that it helps in the absorption of Rasa and transport rasa to the heart. Actually, digestion is a chemical process mainly done by Pachaka pitta but Samana vayu helps in digestion, indirectly. Samana vayu helps in secreting mechanism and makes different movements of digestive organs like peristalsis, anti-peristalsis, segmentation, deglutition and propagation. It gives strength to the agni. It's vitiated state results in agnimandya and subsequent production of ama. Sama rasa will produce its mala rupa kapha which is also vitiarted.

(5) **Apana Vayu**

**Sthana:** Site of Apana vayu is Pakvadhana, Guda, Vrishana, Basti, Medhra, Nabhi, Uru, Vankshana and Shroni.

**Karma:** Its functions are expulsion of Mutra, Purisha, Shukra, Garbha, Artava. All the normal functions of body are depend upon the normalcy of Apana Vayu. Mutra and Purisha have been considered as Mala which are able to produce diseases if not excreted at their regular interval. Apana Vayu excretes mutra which is necessary for kledavahana. The main function of Mutra is to carry Kleda from internal to external environment. Vrikka is the organ situated in Koshtha which is the Sanchari Sthana of Samana vayu. Thus, all the functions of Vrikka are attributed to Samana, Vyana and Apana vayu.
Table No. 1 Symptoms due to *Vata* dosha in C.P.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of <em>vata</em> dosha</th>
<th>Symptoms seen in Cerebral Palsy</th>
</tr>
</thead>
</table>
| 1       | Prana               | - Feeding difficulties, increased regurgitation (improper *Anna Pravesh*ha).  
|         |                      | - Disturbed sleep pattern (improper functioning of *Chitta* i.e. *Mana*).  
|         |                      | - Impaired intelligence (improper function of *Buddhi*).  
|         |                      | - Increased chances of respiratory infection (improper function of *Shthivana* & *Kshavathu*). |
| 2       | Udana               | - Speech problems (improper functioning of *Vak Pravritti*).  
|         |                      | - Memory and intelligence (improper function of *Smriti*).  
|         |                      | - Unable to do strenuous activities (improper function of *Urja* and *Bala*).  
|         |                      | - Effortlessness (improper function of *Prayatna*). |
| 3       | Vyana               | - Improper nutrition (due to improper *rasa*, *rakta samvahana*).  
|         |                      | - Difficulty in normal movements (improper *pancha cheshta*).  
|         |                      | - Involuntary movement like - Convulsions, Clonus, ataxia.(vikrit cheshta.) |
| 4       | Samana              | - Improper digestion (improper function of *Pachana*).  
|         |                      | - Improper metabolism (improper functioning of *Vivechana* and *Munchana karma*).  
|         |                      | - Poor appetite (due increased *Ama* as *kitta* is not separated properly). |
| 5       | Apana               | - Bowel incontinence (improper functioning of *Purisha Dharana*).  
|         |                      | - Bladder incontinence (improper function of *Mutra Dharana*).  
|         |                      | - Constipation (improper function of *Purisha Nishkramana*). |

**Involvement of *Pitta* dosha in Cerebral Palsy**

(1) **Sadhaka Pitta**  
**Sthana:** The main location of is *Hridaya*.  
**Karma:** Its functions are *Buddhi*, *Medha*, *Abhiman*, *Shaurya*, *Bhaya*, *Krodha*, *Harsha*, *Moha*. Sadhaka *pitta* helps to keep away *Kapha* and *Tama* which hampers *Chetana* to do its normal functions and makes *Mana* free from such *Avarana* of *Tama*.

(2) **Pachaka Pitta**  
**Sthana:** The main location is between *Amashya* and *Pakwashaya*.  
**Karma:** *Anna pachana* (digestion), *sara – kitta vibhajana* (separation between useful and waste parts of *anna*).  
*Pachaka Pitta* is the main amongst all other types of *Pitta*.

Table No. 2 Symptoms due to *Pitta* dosha in C.P.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of <em>Pitta</em> dosha</th>
<th>Symptoms seen in Cerebral Palsy</th>
</tr>
</thead>
</table>
| 1       | Pachaka               | - Improper digestion (improper function of *pachana*).  
|         |                       | - Improper metabolism (improper functioning of *Sara – kitta vibhajana*). |
| 2       | Sadhaka               | - Cognition impairment (improper function of *buddhi*).  
|         |                       | - Intelligence impairment (improper functioning of *medha*).  
|         |                       | - Memory impairment (improper functioning of *budhi* and *medha*).  
|         |                       | - Depression (improper development of *abhiman*). |
Involvement of Kapha dosha in Cerebral Palsy
(1) Tarpaka Kapha
Sthana: Shira.
Karma: It makes tarpana of shira pradesha. By its snehana property, it nourishes the majja of mastishka and by its saumya quality soothens the indriya enabling them to perform their ascribed functions. Tarpaka kapha provides nutrition to the developing brain and also helps in proper functioning of nervous system. Vitiation of tarpaka kapha during growth and development leads to defects in brain which can be manifested in the form of symptoms of cerebral palsy. The growth of nervous system mainly occurs during foetal period and up to the age of 2 year after birth. If improper nutrition or damage to developing nervous system occurs during this period, it may lead to the conditions like cerebral palsy. The role of Vata and kapha doshas are almost opposite to each other. Vata prakopa leads to improper production of Tarpaka Kapha and hence improper nutrition of mastishkgata majja i.e. brain.

(2) Shleshaka Kapha
Sthana: Site of shleshaka kapha is at the sandhi i.e. joints. The concept of sandhi is very broad in Ayurveda. It includes bony joints and all kinds of unions where movement is possible. It includes union of bones as well as union of cells, tissues, etc. Karma: Function of Shleshaka kapha is Sandhi sanslesha and Sandhi anugraha i.e. it keeps the joints firmly united, provides lubrication, protects from articulation, and opposes separation. In all bony joints shleshmadhara kala is present, which provide strength and lubrication to snayu (tendons) and peshi (muscles). In case of cerebral palsy, vata dosha is mainly involved. Vata prakopa leads to improper production and working of Shleshaka Kapha which leads to improper movement at sandhi.

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Type of kapha dosha</th>
<th>Symptoms seen in Cereal Palsy</th>
</tr>
</thead>
</table>
| 1.     | Tarpaka             | • Improper nutrition to brain (improper functioning tarpana).  
|        |                     | • Non progressive disturbances in the development of brain. (improper functioning myelination).  
|        |                     | • Improper sensory, motor and mental functions (improper functioning of Indriyas-Gyanendriya, Kar mendriya and Ubhayendriya i.e. Mana.)          |
| 2.     | Shleshaka           | • Contractures (improper movement due to kapha kshaya).  
|        |                     | • Deformities (improper functioning of anugraha).  
|        |                     | • Subluxation (improper functioning of anugraha).  
|        |                     | • Spasticity (improper movement due to kapha kshaya).          |

Maansik Dosha
Mana: It is considered as the controller of all psychological states as well as Indryas. The strength of Indryas is derived from the Manas. It is usually defined as the part of a person which consists of thoughts, feeling and function of willing. Impairment of these processes result in the psychological disorders. Its entity in the body can be recognized by variety of emotional and mental states - viz. fear, grief, anxiety, rage, etc. In Bhela Samhita, Mastiska has been described as the abode of Mana. It has been stated that Mana and Vata work as synergism. Thus, it is clear that vitiated Vata will cause vitiation of Vata also and vice versa producing pathologies. Raja and Tama: Raja and tama are state of defective satva due to a fraction of agitation and ignorance present in them, re-
spectively. They produce hampered functions of *mana* through their *chala* and *guru guna*, respectively. They also vitiate *sharirika doshas*. They are responsible for *manovikara* such as *bhaya*, *krodh*, *lobha*, *chinta*, *shoka* etc. Acharya Charak has mentioned in *Vidhishonitiya adhayaya* that a person under the influence of *Raja and Tama*, if indulges *malini aha*, the *tridoshas* get vitiated causing *avarodh* in *rasa*, *rakta* and *sanghyavaha strotas* and produce important psychological symptoms as are seen in cerebral palsy.

**Tama**: In case of cerebral palsy, *tama* is dominantly involved which is *guru* and *jada*. This leads to lack of interest in surroundings, unwillingness, decreased processing of thoughts and feelings.

**Raja**: Symptoms like fear, grief, anxiety, rage, etc are attributed with *Raja*.

*Vata vyadhi* and Cerebral Palsy have basic similarity in terms of their causes, etiopathogenesis, signs and symptoms. Hence, it can be said that Cerebral palsy is a *Vata* dominant *vyadhi*. In the dysfunctioning of physical and mental processes, it works in unison with the help of other entities i.e. *Sadhaka Pitta*, *Pachaka Pitta*, *Shleshaka Kapha* & *Tarpaka Kapha* and also with *Maansika doshas* *Raja* and *Tama*.

**CONCLUSION**: Cerebral Palsy is one of the common entities responsible for debility in childhood. Though its pathogenesis is not evident in Ayurvedic texts, it can be implicit by looking at the *sthana* and *karma* of *doshas* and relating it with symptoms produced by those *doshas*. *Vata* being the main causative agent, all five of its types are vitiated along with *Sadhaka Pitta*, *Pachaka Pitta*, *Shleshaka Kapha* & *Tarpaka Kapha*. *Maansika doshas* viz. *Raja* and *Tama* are also involved in pathogenesis. Thus, Cerebral Palsy can be concluded as *Vata Pradhana Tridoshaja vyadhi*.

**REFERENCES:**
5. Agnivesh, Charak samhita, Ravindra Tripathi, Poorvardha, Sutrasthan12/46, Chaukhamba Sanskrit Pratisthan, Delhi, Reprint 2003.
19. Vagbhatta, Ashtang Hridaya, Brahmananda Tripathi, Sutrasthana, 20/6-7, Chaukhamba Sanskrit Pratishthan, Delhi, Reprint 2009.
27. Agnivesh, Charak samhita, Ravidutta Tripathi, Poorvardha, Sharirasthana, 7/10, page 766, Chaukhamba Sanskrit Pratishthan, Delhi, Reprint 2003.
30. Vagbhatta, Ashtang Hridaya, Brahmananda Tripathi, Sutrasthana, 12/10-12, page 172, Chaukhamba Sanskrit Pratishthan, Delhi, Reprint 2009.

Corresponding Author:
Dr. Kishor Gavali, Research Officer (Ayu) RARIMCH, Nagpur.
Email: dr.kishorgavali@rediffmail.com

Source of support: Nil
Conflict of interest: None
Declared

Cite this Article as: Gavali Kishor et al: Role of Doshas in the Pathogenesis of Cerebral Palsy - A View