



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

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### **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 *Maansika 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.<sup>1</sup> CP is also commonly associated with a spectrum of developmental disabilities including mental retardation, epilepsy and visual, hearing, speech, cognitive, and behavioural abnormalities.<sup>2</sup> 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 retard-

dation, 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<sup>3</sup>. 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 vitiated *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*.<sup>4</sup> 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*.<sup>5</sup> It controls different mechanism of body and generate various *chestas* (every voluntary / involuntary movements), so it is called as a *Tantra Yantra Dhara*. *Praspan danam*.<sup>6</sup> *Vayu* keeps balance of *Dosha*, *Dhatu* and *Agni*, it leads all the function of body and mind (*Buddhi karma*) smoothly.<sup>7</sup> *Kapha*, *Pitta*, *Malas* and *Dhatus* are *Pangu* i.e. immovable without *vayu*. So *vayu* is responsible for their proper movement to their respective place.<sup>8</sup> 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.<sup>9</sup> 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*<sup>10</sup>. The *Indriya-Pranavaha srotasas* are the channels or the tracts which convey *prana*. The *upaghata* of specific *Indriya-Pranavaha strotasa* leads to specific *Indriya upaghat*.

**Karma:** Acharya *charaka* has explained the functions of *Prana vayu* as *shthivana*, *kshavathu*, *udgaara*, *shwasa*, *Annapravesh*<sup>11</sup>. After exertion, if one is opposing natural urge of extra air (*shramashwasa vidharanat*) then he will suffer from *Gulma*, *Hridroga* and *Samoha*<sup>12</sup>.

According to *Sushruta*, *Pranavalabhan karma* is also another function of *Prana Vata*.<sup>13</sup> Acharya *Vaghbata* has stated four major function viz *Buddhi dharana* (to support), *Indriya Dharana*, *Chitta Dharana* and *Hridaya Dharana*. It regulates and governs the *mana*<sup>14</sup>. 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*.<sup>15</sup> 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*.<sup>16</sup>

**Karm:** Acharya *Charaka* has described the functions of *vyana vayu* as *Gati* (movements), *Prasarana* (extension), *Akshepa* (convulsion), *Unmesha - Nimesha* (blinking)<sup>17</sup>.

*Hridaya* contracts with the help of *vyana vayu* and perform *yugpat vikshepana* (simultaneous throw) of *rasa-rakta* continuously in the entire body.<sup>18</sup>

Hence nourishment of all *dhatus* (tissues) takes place continuously and in circulatory fashion (*parivrittistu 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<sup>19</sup>. *Vyana vayu* performs the *karma* like *Gati*, *Apkshepana*, *Utkshepana*, *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* 15<sup>th</sup> chapter implied that *Praspandana* (*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 *Urasthana*<sup>20</sup>, it means that the organs present in *Urasthana* 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)<sup>21</sup>

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*.<sup>22</sup> *Sweda*, *Dosha*, *Ambuvaha Srotas* are also said to be its sites.

**Karma:** Acharya *charaka* has stated that it gives strength to *Agni*.<sup>23</sup>

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 *kitta* to the lower part of the alimentary canal).<sup>24</sup>

Acharya *Sharangdhara* has stated that it helps in the absorption of *Rasa* and transport *rasa* to the heart.<sup>25</sup>

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 vitiated.

### (5) *Apama Vayu*

**Sthana:** Site of *Apama 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 *Apama Vayu*. *Mutra* and *Purisha* have been considered as *Mala*<sup>26</sup> which are able to produce diseases if not excreted at their regular interval. *Apama 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 *Koshta*<sup>27</sup> which is the *Sanchari Sthana* of *Samana vayu*<sup>28</sup>. Thus, all the functions of *Vrikka* are attributed to *Samana*, *Vyana* and *Apama vayu*.

**Table No. 1 Symptoms due to *Vata dosha* in C.P.**

Sr. No.	Type of <i>vata dosha</i>	Symptoms seen in Cerebral Palsy
1.	<i>Prana</i>	<ul style="list-style-type: none"> <li>• Feeding difficulties, increased regurgitation (improper <i>Anna Pravesh</i>).</li> <li>• Disturbed sleep pattern (improper functioning of <i>Chitta i.e. Mana</i>).</li> <li>• Impaired intelligence (improper function of <i>Buddhi</i>).</li> <li>• Increased chances of respiratory infection (improper function of <i>Shthivana &amp; Kshavathu</i>).</li> </ul>
2.	<i>Udana</i>	<ul style="list-style-type: none"> <li>• Speech problems (improper functioning of <i>Vak Pravritti</i>).</li> <li>• Memory and intelligence (improper function of <i>Smriti</i>).</li> <li>• Unable to do strenuous activities (improper function of <i>Urja and Bala</i>).</li> <li>• Effortlessness (improper function of <i>Prayatna</i>).</li> </ul>
3.	<i>Vyana</i>	<ul style="list-style-type: none"> <li>• Improper nutrition (due to improper <i>rasa, rakta samvahana</i>).</li> <li>• Difficulty in normal movements (improper <i>pancha cheshta</i>).</li> <li>• Involuntary movement like - Convulsions, Clonus, ataxia. (<i>vikrit cheshta</i>.)</li> </ul>
4.	<i>Samana</i>	<ul style="list-style-type: none"> <li>• Improper digestion (improper function of <i>Pachana</i>).</li> <li>• Improper metabolism (improper functioning of <i>Vivechana</i> and <i>Munchana karma</i>).</li> <li>• Poor appetite (due increased <i>Ama</i> as <i>kitta</i> is not separated properly).</li> </ul>
5.	<i>Apama</i>	<ul style="list-style-type: none"> <li>• Bowel incontinence (improper functioning of <i>Purisha Dharana</i>).</li> <li>• Bladder incontinence (improper function of <i>Mutra Dharana</i>).</li> <li>• Constipation (improper function of <i>Purisha Nishkramana</i>).</li> </ul>

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

#### (1) *Sadhaka Pitta*

*Sthana*: The main location of is *Hridaya*.<sup>29</sup>

**Karma:** Its functions are *Buddhi, Medha, Abhimana, 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*.

So, *Mana* becomes more efficient, in turn, enhances *Buddhi, Medha, Abhimana* etc., eventually helps “*Atma*” to achieve its goal.

#### (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*).<sup>30</sup> *Pachaka Pitta* is the main amongst all other types of *Pitta*.

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

Sr. No.	Type of <i>Pitta dosha</i>	Symptoms seen in Cerebral Palsy
1	<i>Pachaka</i>	<ul style="list-style-type: none"> <li>• Improper digestion (improper functioning of <i>pachana</i>).</li> <li>• Improper metabolism (improper functioning of <i>Sara – kitta vibhajana</i>).</li> </ul>
2	<i>Sadhaka</i>	<ul style="list-style-type: none"> <li>• Cognition impairment (improper functioning of <i>buddhi</i>).</li> <li>• Intelligence impairment (improper functioning of <i>medha</i>).</li> <li>• Memory impairment (improper functioning of <i>budhi</i> and <i>medha</i>).</li> <li>• Depression (improper development of <i>abhiman</i>).</li> </ul>

## 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 soothes the *indriya* enabling them to perform their ascribed functions.<sup>32</sup>

*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 *Kapha kshaya*. So,

**Table No. 3 Symptoms due to *Kapha dosha* in C.P.**

Sr.No.	Type of <i>kapha dosha</i>	Symptoms seen in Cerebral Palsy
1.	<i>Tarpaka</i>	<ul style="list-style-type: none"> <li>Improper nutrition to brain (improper functioning <i>tarpana</i>).</li> <li>Non progressive disturbances in the development of brain. (improper functioning myelination).</li> <li>Improper sensory, motor and mental functions (improper functioning of <i>Indriyas-Gyanendriya, Karmendriya and Ubhayendriya</i> i.e. <i>Mana</i>.)</li> </ul>
2.	<i>Shleshaka</i>	<ul style="list-style-type: none"> <li>Contractures (improper movement due to <i>kapha kshaya</i>).</li> <li>Deformities (improper functioning of <i>anugraha</i>).</li> <li>Subluxation (improper functioning of <i>anugraha</i>).</li> <li>Spasticity (improper movement due to <i>kapha kshaya</i>).</li> </ul>

### *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 men-

vitated *Vata dosha* may lead 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.<sup>33</sup> 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*<sup>34</sup> 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*.

tal 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 *Mana* 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 ahara*, the *tridoshas* get vitiated causing *avarodh* in *rasa*, *rakta* and *sangyavaha 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*.

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