

"An Integrated Approach of Neurotherapy and Ayurveda in the Management of Hypotonic Cerebral Palsy: A Case Study"

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Abstract: Hypotonic cerebral palsy is a rare but debilitating form of cerebral palsy that affects muscle tone, motor function, and coordination. Early diagnosis and intervention are critical for improving outcomes and quality of life for individuals with this condition. In Ayurveda, the description of hypotonic cerebral palsy is done under the category of Samanyaj Vaatvyadhi or disorders caused by Vaat and Pitta. This case study presents the case of Shivangi, a 3.5-year-old girl diagnosed with hypotonic cerebral palsy at 8 months. Shivangi's treatment includes an integrated approach of neurotherapy and Ayurveda to improve her muscle tone, motor function, and overall health. The combination of neurotherapy and Ayurveda provides a holistic and individualized treatment plan that addresses the root cause of the condition and supports Shivangi's overall well-being.

Keywords: Hypotonic Cerebral palsy, Neurotherapy, Ayurveda, Integrated approach, Management

Introduction: Hypotonic cerebral palsy is a complex condition that requires a multidisciplinary approach to treatment. Neurotherapy and Ayurveda offer a complementary approach to the management of hypotonic cerebral palsy by addressing the underlying imbalances in the body and supporting overall health and well-being. Hypotonic cerebral palsy (CP) is a neurological disorder that affects muscle tone, movement, and motor skills in children. It is a condition that requires long-term care and management. The conventional management of hypotonic CP primarily includes physiotherapy, occupational therapy, and medication. However, these treatments have limitations and may not provide a complete solution to the problem. In recent years, there has been growing interest in alternative and complementary therapies for the management of hypotonic CP. This case study presents an integrated approach of neurotherapy and Ayurveda in the management of hypotonic CP. Neurotherapy is a complementary therapy that uses natural resources and techniques

to stimulate the nervous system and promote healing. Ayurveda is an ancient Indian system of medicine that uses natural herbs and therapies to promote health and well-being. In Ayurveda, Acharya Charak mentioned about the "Vata" disorder in the Charak Samhita Sutrasthana and classified neuromuscular disorders under "Vata Pitta" disorders.

The objective of this case study is to demonstrate the effectiveness of an integrated approach of neurotherapy and Ayurveda in the management of hypotonic CP. The case study will present the assessment, diagnosis, and treatment plan of a child with hypotonic CP. The treatment plan will include a combination of neurotherapy and Ayurveda therapies. The progress of the child will be monitored and evaluated using various clinical and functional outcome measures.

The findings of this case study may provide insights into the potential benefits of an integrated approach of neurotherapy and Ayurveda in the management of hypotonic CP. The results of this study may help healthcare professionals to develop more comprehensive and personalized treatment plans for children with hypotonic CP. Furthermore, this study may also contribute to the growing body of evidence on the effectiveness of alternative and complementary therapies in the management of neurological disorders.

Case Report: Shivangi is a 3.5-year-old girl diagnosed with hypotonic cerebral palsy at 8 months. She has low muscle tone, poor head control, and delayed motor milestones. Some observations were made, when history was examined. During birth, it was found that her feet were twisted, most probably clubfoot, and it was resolved by plastering. The significant findings were a delay in sitting, walking, neck holding, drooling, significant delay in speech due to discomfort, discomfort causing a lack of smooth brain functioning due to a lack of professional therapy, loose holding and handling, a slight delay in responsiveness to listening and watching, low receptivity, nominal willingness to participate in activities, no questioning ability, and inability to communicate natural needs such as using the toilet or feeling hungry. From 2019 to 2022, the investigations that were conducted were also considered. The findings are below shown in the Table no.1:

Table No. 1

Lab investigations	2019	2020	2021	2022
SMA (Spine Muscular Atrophy)	No SMA Symptoms were observed, however, one copy of SMN 1 carrier absent, thus SMA carrier.	-	-	-
MRI Brain	-	Revealed no significant abnormality	-	-
IEM (Inborn errors of Metabolism)	-	Tandem Mass spectrometry screening report- Negative Gas Chromatography mass spectrometry screening report- Negative	-	-

Ammonia (Enzymatic)- To diagnose hepatic encephalopathy or seizures	-	95.0 – Very High Though she was asymptomatic.)	-	-
SGOT, SGPT	-	-	40.44 U/L, 43.79 U/L; Borderline High	-
Total Protein	-	-	4.74 gm %; Low	-
Hb	-	-	8.0 gm%; Low	-
Immunoassay report-PTH	-	-	7.0; Borderline low	-
EEG	-	-	Normal	-
CK Creatinine (which is responsible for skeletal and cardiac toning)	-	-	-	26.0- Very low

Examination revealed myopathic face, bilateral temporal hollowing, non-paralytic hypotonia, thenar and hypothenar atrophy, Bilateral congenital talipes equinovarus (CTEV), and absent deep tendon

reflexes (DTR). Initially, she was undergoing treatment for global developmental delay and was on a multivitamin therapy.

Shivangi's treatment includes an integrated approach of neurotherapy and Ayurveda. Neurotherapy sessions focus on improving her muscle tone, coordination, and motor function through sensory integration and neurodevelopmental techniques. Ayurvedic treatment includes herbal remedies, dietary changes, and lifestyle modifications to balance the doshas, strengthen the nervous system, and improve overall health.

Discussion: An integrated approach of neurotherapy and Ayurveda provides a holistic and individualized treatment plan for individuals with hypotonic cerebral palsy. Neurotherapy addresses the underlying neurological imbalances that contribute to the condition and promotes the development of new neural pathways. We focused on the root causes and developed a treatment protocol for neurotherapy in which no machinery or equipment was used, and the treatment was completely manual described as follows:

1. **Digestion:** To promote good digestion, we improved intestinal absorption, detoxified the body, and strengthened peristaltic movement by stimulating the gut-brain reflex, especially since she suffered from severe constipation.
2. **Circulatory System-** We enhanced the oxygen levels in the body, particularly in the brain. Oxygen plays a crucial role in the brain as it is responsible for providing the necessary energy to maintain the brain's functions. The brain consumes about 20% of the body's oxygen, even though it only represents about 2% of the body's weight. The brain cells, also known as neurons, require a constant supply of oxygen to produce adenosine triphosphate (ATP), which is the main source of energy for cellular metabolism. Without enough oxygen, the brain cells cannot produce enough ATP, leading to impaired cognitive and motor functions. Moreover, oxygen is essential for the brain's metabolism, which involves the breakdown of glucose to produce ATP. This process is known as oxidative metabolism and requires oxygen as the final electron acceptor in the electron transport chain. The brain's metabolism is highly dependent on oxygen, and any reduction in oxygen supply can result in metabolic disturbances and even cell death. Therefore, maintaining adequate oxygen levels in the brain is critical for optimal brain function and overall health.

3. **Neuromuscular Coordination-** We stimulated the hypothalamus, pituitary, and pineal glands - which are considered the master glands - to aggravate her sensory and motor functions. Hypotonic cerebral palsy is characterized by low muscle tone, weak muscle strength, and poor coordination. The hypothalamus, pineal, and pituitary glands play different roles in the body that can indirectly affect the symptoms of hypotonic cerebral palsy. The hypothalamus is a part of the brain that regulates a variety of bodily functions, including temperature, hunger, thirst, and the release of hormones from the pituitary gland. It produces and releases hormones that stimulate or inhibit the secretion of hormones from the pituitary gland. These hormones include growth hormone-releasing hormone (GHRH) and somatostatin, which affect the release of growth hormone from the pituitary gland. Growth hormone is essential for muscle growth and repair, and its deficiency can contribute to muscle weakness and hypotonia. The pineal gland is a small endocrine gland in the brain that produces melatonin, a hormone that regulates sleep-wake cycles. Melatonin is also thought to have a role in regulating muscle tone, and its deficiency or excess can affect muscle function. The pituitary gland is often referred to as the master gland as it secretes several hormones that control the function of other endocrine glands in the body. These hormones include growth hormone, thyroid-stimulating hormone, adrenocorticotrophic hormone, follicle-stimulating hormone, luteinizing hormone, and prolactin. Growth hormone, as mentioned earlier, is important for muscle growth and repair, and its deficiency can contribute to hypotonia. Thyroid-stimulating hormone affects the production of thyroid hormones, which regulate metabolism, muscle function, and growth. Adrenocorticotrophic hormone affects the production of cortisol, a stress hormone that can modulate muscle tone and function. In summary, the hypothalamus, pineal, and pituitary glands can indirectly affect the symptoms of hypotonic cerebral palsy through their regulation of hormone production and secretion. Hormones such as growth hormone, thyroid hormone, cortisol, and melatonin can affect muscle growth, metabolism, and function, and their deficiencies or excesses can contribute to hypotonia and other symptoms of cerebral palsy.

Ayurveda provides herbal remedies, dietary changes, and lifestyle modifications that support the nervous system and overall health and well-being. The priority to the cause was given than the symptoms and administered the self-formulated pharmacological medicines as follows:

1. **EN Liver (Kutki, Bhumi amalaki)-** To stimulate the functioning of Liver.

2. **EN Kabaz (Senna alexandrina- single herb formulation)-** To subside the additional symptoms of constipation she was suffering with.
3. **EN Bacopa (Bacopa monnieri- single herb formulation)-** To relax the brain in order to sound sleep, subside the hyperactivity of the brain, regeneration of the brain cells, naturally heal the command of the brain leads to connectivity with the concerned muscles and tissues.
4. **EN Bone Health (Moringa, Amla)-** To provide strength to the bones, enhances the mobility and helps in the rejuvenation of the body.

Observations: After the integrated treatment, Shivangi's parents made some observations which were the result of the 6-month treatment. The remarkable findings were improved and are mentioned in Table No. 2 as follow:

Table No. 2

Observations	Before Treatment	After Treatment
Sitting	Delayed	Good
Walking	Delayed	Good; can walk with support
Neck Holding	Delayed	Good
Drooling	Present	Absent
Speech	Delayed; only bisyllables like mama, papa	Good; Could recite a poem and tell the urge of hunger and toilet

Holding and Handling	Loose	Fine
Response towards listening and watching	Delayed	Fair
Receptivity	Low	Good
Willingness to participate in activities	Nominal	Good; tell herself to play, walk etc.
Questioning ability	NIL	Good; answers all the questions asked
Ability to communicate natural needs such as using the toilet or feeling hungry	NIL	Very good

Sitting ability improved, improved neck holding, strong willingness to walk, absence of drooling, tremendous improvement in speech after treatment, significant improvement in brain function, feeling at ease and comfortable due to therapy, exclusively fine and normal holding and handling, fair response to listening and watching, very good emotional connection, tremendous improvement in receptivity, significant improvement in willingness to participate in activities such as exercise, walking, dancing, and reading, increased number of questions being asked and an expectation of good answers due to therapy over the past six months, and the patient is now able to inform about all things simultaneously.

Conclusion: Hypotonic cerebral palsy is a rare but debilitating form of cerebral palsy that affects muscle tone, motor function, and coordination. An integrated approach of neurotherapy and Ayurveda provides a holistic and individualized treatment plan for individuals with this condition.

Shivangi's case highlights the potential benefits of an integrated approach and the need for a multidisciplinary approach to the management of hypotonic cerebral palsy. Further research is needed to explore the efficacy of an integrated approach in the management of hypotonic cerebral palsy.
