

# MANAGEMENT OF GLOBAL DEVELOPMENTAL DELAY WITH MULTIMODAL THERAPY THROUGH AYURVEDA: A CASE REPORT

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## Abstract

Global Developmental Delay (GDD) is a complex condition affecting multiple developmental domains. This case report describes a two-year-old girl with GDD following subdural hematoma, managed through multimodal Ayurvedic therapy. Over six months, Shamana Aushadhi (Brahmi Vati, Kumar Kalyan Ras, Kalyanaka Ghrita, Saraswatharishta) and Panchakarma procedures (Abhyanga, Nasya, Shirodhara, Matra Basti, Shashtika Shali Pinda Swedana, Viddhakarma) with physiotherapy were administered. Clinical outcomes included improved neck holding, muscle strength, reduced spasticity, better appetite and sleep, and enhanced DASII scores (Motor DQ: 42→52; Mental DQ: 38→40). Findings highlight Ayurveda's potential in supporting neurodevelopmental recovery in pediatric GDD.

**Keywords:** Ayurveda, Panchakarma, Medhya Rasayana, Subdural Hematoma, Global Developmental Delay, Viddhakarma, DASII Assessment.

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## Introduction:

Over the course of a lifetime, human development falls into three categories: physical, cognitive, and psychosocial. Developmental milestones that advance over time and through social interaction include linguistic, cognitive, social, psychological, and fine and gross motor development. These could impact a single local domain, multiple global domains, or all developing regions worldwide<sup>1</sup>. If a youngster cannot fulfill the developmental milestones for their age, it is deemed that they have a developmental delay. Developmental disorders should be addressed because they are social and medical issues<sup>2</sup>. According to the World Health Organization (WHO), 3.8% of Indians, or about 10% of the global population, are disabled<sup>3</sup>. Childhood developmental delays, attention deficit disorders, speech issues, hyperkinetic disorders, behavioural issues, etc. are all made more likely by inadequate medical care. Thanks to advancements in prenatal and neonatal care as well as frequent visits to higher institutions, many newborns have a higher chance of surviving<sup>4</sup>. Samvardhana vikaras, which are marked by abnormal growth and clinical symptoms like mooka (dumbness), ashruiti (deafness), pangu (lameness), and jada (mental retardation), are primarily connected with vata.<sup>5</sup>

## 1. Patient Information:

A 2-year-old girl presented to Kaumarbhritya OPD with delayed development. She has been unable to stand or walk independently for 1.5–2 years, cannot speak, has persistent drooling, and poor neck

control. Development was normal until 7 months, after which delays became evident. At 1.5 years, she still required support for sitting, standing, and walking. Birth history was normal (full-term, 3 kg, cried immediately). At 1 month, she was admitted to NICU for high-grade fever and convulsions. No significant prenatal or family history. Recently diagnosed with left subdural hematoma in parietal, temporal, and occipital lobes with midline shift.

## 2. Clinical Findings:

Table No. 1 Clinical Examination

| Clinical Examination on 1 <sup>st</sup> Sitting<br>01/06/25                                                   | Clinical Examination on 2 <sup>nd</sup> Sitting<br>16/11/25                      |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Pulse – 127<br>B.P. – 90/70<br>R.R – 27<br>Temp- 98<br>Weight –12kg<br>Height -78cm                           | Pulse- 117<br>B.P-90/60<br>R.R-27<br>Temp-98<br>Weight – 13kg<br>Height- 81.6 cm |
| Systemic Examination 1 <sup>st</sup> Setting<br>01/06/25                                                      | System Examination 2 <sup>nd</sup> Setting<br>16/11/25                           |
| Central Nervous System - concious, alert .<br>Cardio Vascular System- s1s2 heard<br>Respiratory System- AB=BE | Central Nervous System - concious, alert .<br>Cardio Vascular System- s1s2 heard |

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|                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digestive System- Good<br>Urinary system- Normal,<br>4-5 times/ day Muscular<br>skeletal system- Before<br>treatment - Grade1-<br>Flicker of contraction<br>present 1st setting Muscle<br>power-Grade 2 Active<br>movement with gravity<br>eliminated | Respiratory System-<br>AB=BE<br>Digestive System-<br>Good<br>Urinary system-<br>Normal, 4-5 times/<br>day Muscular<br>skeletal system –<br>2nd setting Muscle<br>power – Grade 3<br>Active movement<br>against gravity |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3. Diagnostic Assessment:

Patient had a history of left subdural hematoma in parietal, frontal, temporal occipital lobe with Midline shift (CT head) Diagnosed on 14/06/23.

### 5. Timeline

Table NO. - 2

| DATE / PERIOD      | CLINICAL EVENT                                                                                                                         |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Birth              | Full-term normal delivery; birth weight 3 kg; normal neonatal adaptation.                                                              |
| 1 month of age     | Hospitalized with high-grade fever and convulsions; admitted to NICU.                                                                  |
| After 7 months     | Developmental delay became evident with poor neck control, delayed motor milestones, absent speech, and persistent drooling of saliva  |
| 14/06/2023         | CT head confirmed left subdural hematoma with midline shift.                                                                           |
| 01/06/2025         | First visit to Kaumarbharitya OPD; baseline clinical and developmental assessment performed; multimodal Ayurvedic treatment initiated. |
| June–November 2025 | Five sittings of multimodal Ayurvedic therapy (Shamana medications, Sarvanga Abhyanga,                                                 |

|                 |                                                                                                                                                                                                                       |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | Pratimarsha Nasya, Shirodhara, Matra Basti, Shashtika Shali Pinda Swedana, and Viddhakarma) along with physiotherapy.                                                                                                 |
| Final Follow-up | Improvement observed in neck holding, lower-limb muscle power (MRC Grade 2/5 to 3/5), reduction in spasticity, improved appetite and sleep, reduced drooling, weight gain (12 kg to 13 kg), and improved DASII scores |

### 6. Therapeutic Interventions:

Table 3: Treatment: Shamana Chikitsa

| Sr No. | Internal Medication with Dose                         | Duration                                                                    |
|--------|-------------------------------------------------------|-----------------------------------------------------------------------------|
| 1      | Brahmi Vati<br>½ - 0 - ½ A/F                          | Same internal medicines was given for all 6 sitting as discharge medication |
| 2      | Kumarkalyan Ras<br>1-0-0 A/F                          |                                                                             |
| 3      | Kalyanaka Ghrita<br>10 ml -0-0 B/F                    |                                                                             |
| 4      | Saraswatharista<br>5ml with Equal proportion of water |                                                                             |

Table NO.4 : Treatment: *Bhrimhana Chikitsa & Therapeutic Procedure*

| DATE                                                 | TREATMENT GIVEN                                                                                                                   | DURATION |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------|
| 1 <sup>ST</sup> sitting<br>(01/06/2025 – 15/06/2025) | Sarvang Abhyanga with Bala tail (30 min)<br>Pratimarsha Nasya brahmi 1 drop each nostril                                          | 15 Days  |
| 2 <sup>ND</sup> sitting<br>(14/07/2025 – 21/07/2025) | Sarvang Abhyanga with Bala tail (30 min)<br>Pratimarsha Nasya brahmi 1 drop each nostril<br>Shirodhara brahmi Tail 500 ml (15min) | 7 Days   |
| 3 <sup>rd</sup> sitting<br>(19/08/2025)              | Sarvang Abhyanga with                                                                                                             | 15 Days  |

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|                                                    |                                                                                                                                                                                                                         |         |  |  |                                                                                                                                                                                                                                        |  |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| –<br>04/09/2025)                                   | Bala tail (30 min)<br>Pratimarsha<br>Nasya brahmi 1 drop each nostril<br>Shirodhara<br>brahmi Tail 500 ml (15min)<br>Matra Basti with Dashmoola Tail (20ml)<br>Vidhakarma 26 ½ Needle<br>Shankha Marma & Sthapani Marma |         |  |  | Pratimarsha<br>Nasya brahmi 1 drop each nostril<br>Shirodhara<br>brahmi Tail 500 ml (15min)<br>ShastiShali Pinda Swedana (30min)<br>Vidhakarma 26 ½ Needle<br>Shankha Marma & Sthapani Marma<br>Matra Basti with Dashmoola Tail (20ml) |  |
| 4 <sup>th</sup> sitting ( 02/09/2025 – 17/10/2025) | Sarvang Abhyanga with Bala tail (30 min)<br>Pratimarsha<br>Nasya brahmi 1 drop each nostril<br>Shirodhara<br>brahmi Tail 500 ml (15min)<br><i>ShastiShaliPinda Swedana(30min)</i>                                       | 15 Days |  |  |                                                                                                                                                                                                                                        |  |
| 5 <sup>th</sup> sitting ( 16/11/2025 – 31/11/2025) | Sarvang Abhyanga with Bala tail (30min)                                                                                                                                                                                 | 15 Days |  |  |                                                                                                                                                                                                                                        |  |

Figure No.1 Vidhhakarma Procedure

## 7. OBSERVATION AND RESULTS

Numerous subjective and objective measures were evaluated both prior to and following treatment. The clinical examination and parental observations served as the basis for the subjective evaluation. The DASII assessment demonstrated improvement in both motor and mental developmental quotients after multimodal Ayurvedic intervention. Motor DQ improved from 42 to 52, while Mental DQ improved from 38 to 40. The child showed better neck holding, improved voluntary movements, reduced spasticity, increased responsiveness to surroundings, and

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improved social interaction, indicating positive developmental progress following therapy.

Table No. 5 : DASII Assessment Before and After Treatment <sup>6</sup>

| Parameter                        | Before Treatment           | After Treatment                                                           |
|----------------------------------|----------------------------|---------------------------------------------------------------------------|
| Motor Developmental Age          | 10 months                  | 13months                                                                  |
| Mental Developmental Age         | 9 months                   | 11months                                                                  |
| Motor Development Quotient (DQ)  | 42                         | 52                                                                        |
| Mental Development Quotient (DQ) | 38                         | 40                                                                        |
| Overall Developmental Status     | Severe Developmental Delay | Moderate developmental delay with improvement in developmental functions. |

Table NO. 6 Comparative Analysis : Pre & Post Therapeutic Results

| BEFORE TREATMENT                                                                                    | AFTER TREATMENT                                                                                                                |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Unable to hold Neck                                                                                 | Able to hold Neck                                                                                                              |
| Appetite: Reduced<br>Sleep: Disturbed<br>Bowel: Once in 2-3 days<br>Dribbling of saliva: Present ++ | Appetite: Improved<br>Sleep: Improved<br>Bowel: Regular (once a day)<br>Dribbling of saliva: Present + (comparatively reduced) |
| Weight :12kg<br>MAC:13cm (R and L)<br>MTC:21cm (R and L)                                            | Weight: 13 kg<br>MAC: 14cm (R and L)<br>MTC:23cm (R and L)                                                                     |
| Muscle power (Medical Research Council Scale)<br>UL 3/5(R and L)<br>LL: 2/5(R and L)                | UL- 3/5(R and L) LL: 3/5(R and L) Spasticity is reduced to 20% as per the informant.                                           |

|                                                                                                          |                                                                                    |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Muscle Tone (Modified Ashworth scale):<br>Hypertonic, Spasticity present                                 |                                                                                    |
| ROM with goniometer<br>Elbow flexion-100-degree<br>Knee flexion -80-degree<br>Plantar flexion -20 degree | Elbow flexion- 120-degree<br>Knee flexion -90-degree<br>Plantar flexion- 25 degree |



Unable To Hold Neck Before Treatment  
Able To hold Neck After Treatment

Figure No.2 Improvement before and after treatment

## 8. DISCUSSION

A 2 yr old female child with GDD saw significant improvements in motor, cognitive, and functional outcomes after a six-month multimodal Ayurvedic regimen and physical therapy, which lessened the severity of the developmental delay. Larger, well planned controlled studies are necessary to verify efficacy, comprehend processes, and establish long-term advantages in broader clinical practice for children with complex needs, even if these hopeful results point to potential therapeutic utility.

### Vidhakarman

During the third and fifth sittings, Vidhakarman was applied superficially over Sthapani Marma and bilateral Shankha Marma. After receiving multimodal therapy, patient shown improvements in neck holding, muscle strength, decreased spasticity, drooling, and developmental quotients.

Viddhakarma was administered over the \*\*Brain Autonomic Line (BAL)\*\* , a therapeutic zone on the scalp thought to affect higher brain functioning and autonomic regulation. In children with developmental abnormalities, stimulation of scalp regions has been shown to promote cerebral blood flow, cortical activation, and neuroplasticity, potentially improving motor, cognitive, language, and behavioural abilities. In a similar vein, traditional East Asian acupuncture places a strong emphasis on stimulating the Governor Vessel (Du Meridian) and scalp regions in order to control brain activity and foster neurological growth. Thus, improved neuromodulation and neuroplastic adaptation brought on by Viddhakarma may be responsible for the clinical improvements shown in this instance. However, more clinical study is required to confirm the precise function of the Brain Autonomic Line because this suggested mechanism is based on indirect evidence from scalp acupuncture trials.<sup>7</sup>

Vidhakarma one of the Ashtavidha shastra karmas, Alleviates Vatavarodha by removing Dushita rakta and vitiated vata and other doshas from the body.<sup>8</sup> Viddhakarma is an affordable, safe, and minimally invasive treatment that shows promise for both pain relief and functional recovery. Its broader clinical acceptance and international recognition depend on standardized protocols, strong clinical trials, and interdisciplinary integration.<sup>9</sup>

*Suśruta Samhitā* is the primary classical text describing the principles of Viddhakarma; however, Acharya Suśruta advises against its use in Bala (children) as mentioned in *Śārīra Sthāna*<sup>6</sup>. Despite this, modified forms of Viddhakarma are employed by some contemporary practitioners in the management of Global Developmental Delay (GDD), considering its association with Vata Vyadhi and *Jada*<sup>7</sup>. In modern practice, a micro and superficial form of Viddhakarma, often without bloodletting, is used to stimulate Marma points and nerve endings with the objective of removing *Srotavarodha* and enhancing reflexes and motor functions<sup>8</sup>. Classical pediatric texts such as *Kāśyapa Samhitā* recommend non-invasive alternatives for developmental disorders like Phakka Roga and Bala Graha, as invasive puncture procedures are cautioned against in children<sup>9,10</sup>.

In the context of GDD, which can be correlated with Bala Samvardhana Janya Vatavikruti, selective stimulation of head Marma points is believed to activate neurodevelopmental pathways by influencing Manovaha Srotas and Tarpaka Kapha. Among these, Sthapani Marma, located between the eyebrows, is associated with improvement in concentration, intellect (*Buddhi*), and executive functions, while Shankha Marma, situated in the temporal region, correlates with speech, language, and auditory processing—domains commonly affected in GDD<sup>11,12</sup>.

Mode of Action of Shamana Aushadhi and Adjuvant Therapies

Brahmi Vati acts as a Medhya Rasayana, enhancing *Dhi* (intellect), *Dhriti* (retention), and *Smriti* (memory) by nourishing Majja Dhatu and improving higher cortical functions<sup>13</sup>. Kumar Kalyana Rasa exhibits *Srotoshodhana* and *Vyadhi-pratyanika* properties; its micro-fine formulation facilitates rapid penetration into Sukshma Srotas, thereby improving cerebral and musculoskeletal circulation and supporting attainment of delayed developmental milestones<sup>14</sup>. Kalyanaka Ghrita functions as a Yogavahi, delivering active principles deep into the central nervous system and Majja Dhatu, clearing Manovaha and Majjavaha Srotas, nourishing *Majja* and *Ojas*, and providing neuroprotective effects<sup>15</sup>. Saraswatharishta has been shown to reverse neuronal injury in brain regions such as the cerebral cortex and hippocampus by reducing oxidative stress and inhibiting apoptosis<sup>16</sup>.

Among Panchakarma therapies, *Nasya* with Brahmi Taila facilitates direct drug delivery to the brain via the nasal route, influencing higher neurological, endocrine, and circulatory centers and alleviating disorders of the head<sup>17</sup>. Shirodhara with Brahmi oil promotes the release of neurotransmitters, resulting in psycho-somatic balance, neuromuscular relaxation, and reduction of stress, anxiety, and intellectual disturbances<sup>18</sup>. Sarvanga Abhyanga activates the parasympathetic nervous system, reduces heart rate and blood pressure, modulates pain through gate control mechanisms, and induces neuroendocrine release of endorphins, serotonin, and dopamine<sup>19</sup>. Matra Basti with Dashamoola Taila acts as a *Brumhana Karma*, clearing obstructed channels, alleviating dryness, and balancing Vata Dosha<sup>20</sup>, while Shashtika Shali Pinda Swedana enhances muscle strength, stimulates digestive fire, and balances all three Doshas<sup>21</sup>. Several studies have established Basti therapy as effective in the management of Vata Vyadhi<sup>22,23</sup>. Complementary physiotherapy exercises further improve blood circulation, strengthen limbs, reduce spasticity, prevent contractures, and support functional motor development<sup>24</sup>.

### 9. Conclusion:

This case demonstrates how multimodal Ayurvedic therapy can improve the developmental outcomes of a child who had a subdural hematoma and had global developmental delay. The integration of Medhya Rasayana formulations, Panchakarma procedures, Viddhakarma and physiotherapy contributed to measurable gains in motor strength, spasticity reduction, hunger, sleep, and DASII scores. The youngster showed notable functional improvement, moving from severe to moderate developmental delay, even though full developmental normalcy was not attained. These results imply that Ayurveda could be used in pediatric neurorehabilitation as a

supplemental and supporting method. To create uniform techniques and demonstrate efficacy, more controlled research are necessary.

#### 10. Patients Mother Perspective

My two-year-old daughter, who has a developmental delay, has made significant improvement in just six months. She slept better, her appetite increased, her neck holding improved, and dribbling of saliva decreased. Seeing these improvements makes me feel optimistic.

#### 11. Inform Assent

Written permission for the publication of the study and photographs was obtained from the patient .

#### 12. Conflict of Interest

Authors have no conflict of Interest.

#### 13. Declaration of Usage of AI

It is used to improve Manuscript's language.

#### 14. Source of Funding

Nil

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