

# Ayurveda Management of Global Developmental Delay (*Bala Samvardhan Janya Vatavikruti*) by collaborative approach of *Shaman* and *Bhrimhana Chikitsa* in Ayurveda-A Case Report

## Case Report

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## Abstract

**Background:** A child with global developmental delay is unable to attain developmental milestones owing to brain damage which leads to impairment in gross and fine motor, personal social, speech, and activities of daily living (ADL). **Aim and objectives:** To evaluate the effectiveness of *panchakarma* procedures in a child with global developmental delay. **Materials & Methods:** A 3-year-old boy was diagnosed with neuroblastoma and had undergone surgery 2 year back. His parents approached us with complaints of being unable to stand, walk, talk, & ataxia after surgery. There was a significant loss of gross motor function and strength in the lower and upper limbs. The patient underwent treatment with *Shaman Chikitsa* (medicine interventions) followed by *Bhrimhana Chikitsa*. In his 1<sup>st</sup> sitting, *Sarvanaga Abhyanga*, *pratimarsha Nasya*, *Shashtika-Shali-Pinda Swedana*, *Shirodhara*, and *matra Basti* were given for 15 days. **Observations and Result:** Assessment was done with standard developmental delay parameters i.e GMFCS-Gross motor function classification system. Significant improvement were observed in the domains of gross motor, fine motor, personal-social and language milestones before and after treatment. **Discussion:** Elimination of *vataprakop* is the first line of treatment, this is done by *shamana* and *panchakarma bhrimhana Chikitsa*. By combining the *shamana*, *panchakarma* and physiotherapy a significant improvement was observed, especially in the gross motor milestones as per GMFCS, sitting from grade-2 before treatment to grade-4 after treatment, in standing from grade-0 to grade-2, fine motor from grade-1 to grade-3, language from grade-2 to grade-4, personal & social from grade-2 to grade-5. **Conclusion:** In a nutshell, GDD can be managed by multimodal interventions such as Ayurveda procedures, medicines, and physiotherapy.

**Keywords:** *Bala samvardhan janya vatavikruti*, Global developmental delay, *Shamana Chikitsa*, *Pratimarsha Nasya*, *Shashti-Shali-Pinda Swedana*, *Shirodhara*, *Anuvasana Basti*, *Niruha Basti*.

## Introduction

The three types of human development that occur over the course of a lifetime are physical, cognitive, and psychosocial. Developmental milestones like, Linguistic, Cognition, Social, Psychological, as well as Fine and Gross Motor Development advance over time and through interaction with others. These can have a localized impact on just one domain, a multi-domain, or a global impact on all developing areas(1). When a child is unable to reach the developmental milestones for the appropriate age, it is said that the child has a developmental delay. Developmental disabilities should be solved because they are societal and medical issues (2). According to the WHO (World Health

Organization), 3.8% of Indians have some sort of disability, which accounts for nearly 10% of the global population (3). The childhood developmental delays, attention deficit disorders, speech issues, hyperkinetic disorders, and behavioural problems, etc, are increased as a result of inadequate medical treatment and other factors. Advancements in neonatal and prenatal care as well as repeated visits to higher centres improve the chances of survival for many newborns (4). *Samvardhana vikaras* are characterised by abnormality in development and clinical signs such as *mooka* (dumbness), *ashruti* (deafness), *pangu* (lameness), and *jada* (mental retardation), with *vata* as the primary dosha involved(5).

## Patient's information

A boy patient who is 3 years old, with normal development uptill 1 years of age. He was diagnosed with neuroblastoma and got operated before 2 years with ongoing allopath treatment. After the operation, he has complained of being unable to stand, walk, talk along with ataxia and nystagmus. The length and specifics of the chief complaints are shown in Tables 1.

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**Table 1: Chief complaints with duration**

S.N	Chief complaint	Duration
1	Difficulty in standing (unable to stand without support)	2 years
2	Difficulty in walking (unable to walk without support)	1 year
3	Unable to talk	1 year
4	Ataxia	1 year
5	Nystagmus	1 year

**Progress of disease**

The patient, who had been healthy until the age of a year, then experienced a sudden seizure and was taken to the hospital for treatment, was eventually diagnosed with neuroblastoma and underwent surgery; however, he was still unable to stand, sit, walk, or talk like other children of his age and also experienced involuntary head shaking and nystagmus in both of his eyes. The patient then approached to the MGACH&RC's KaumarabhrityaOPD for Ayurvedic treatment and diagnosed as ataxic Global Developmental Delayed.

**Table 3: Clinical and systematic Examination**

Clinical Examination 1 <sup>st</sup> setting (15 July 2021)	2 <sup>nd</sup> setting (7 Nov 2021 )	Systematic Examination 1 <sup>st</sup> setting(15July2021)	2 <sup>nd</sup> setting (7 Nov 2021 )
<b>Pulse</b> – 119/min <b>B.P.</b> – 90/60 mmHg <b>RR</b> - 27/min <b>Temperature</b> – 98 F <b>Weight</b> - 10.5 kg <b>Height</b> -94cm	<b>Pulse</b> -122/ min <b>B.P.</b> -90/60mmHg <b>RR</b> -27/min <b>Temperature</b> -98F <b>Weight</b> -11.5 kg <b>Height</b> -95cm	<b>Central Nervous System</b> - concious, oriented. <b>Cardio Vascular System</b> - s1s2 heard <b>Respiratory System</b> -AB=BE <b>Digestive System</b> - Good <b>Urinary system</b> - Normal, 4-5 times/ day <b>Muscular skeletal system</b> - <b>Before treatment - Grade1</b> - Flicker of contraction present <b>1<sup>st</sup> setting</b> <b>Muscle power-Grade 2</b> Active movement with gravity eliminated	<b>Central Nervous System</b> - concious, oriented. <b>Cardio Vascular System</b> - s1s2 heard <b>Respiratory System</b> -AB=BE <b>Digestive System</b> - Good <b>Urinary system</b> - Normal, 4-5 times/ day <b>Muscular skeletal system</b> – <b>2<sup>nd</sup> setting</b> <b>Muscle power – Grade 3</b> Active movement against gravity

**Table 4: Asthavidha pariksha**

1 <sup>st</sup> setting (15july 2021)	2 <sup>nd</sup> setting (7 Nov 2021 )
<b>AsthavidhaPariksha:</b> <b>Nadi</b> – Vaat-kaphaja <b>Mala</b> – once/ day <b>Mutra</b> – 5-6 times a day <b>Jivha</b> – Saama <b>Shabda</b> – Shpashta <b>Sparsha</b> – Anushna Sheet <b>Drik</b> – Samyak <b>Akruti</b> – Madhyama	<b>AsthavidhaPariksha:</b> <b>Nadi</b> – Vaat-kaphaja <b>Mala</b> – once/ day <b>Mutra</b> – 5-6 times a day <b>Jivha</b> – Saama <b>Shabda</b> – Shpashta <b>Sparsha</b> – Anushna Sheet <b>Drik</b> – Samyak <b>Akruti</b> – Madhyama

**Differential diagnosis** :Cerebral palsy, Duchenne muscular dystrophy, Developmental delay (*Bala samvardhan janya vatavikruti*)

**Diagnosis:**

The assessment grade is done by Gross Motor Function Classification scale (GMFCS), Activity Daily Living (ADL) scale, Modified Ashworth scale (MAS)

**Patient's history**

Patient had a history of operation on neuroblastoma before 2 years. Details of family and patient's history are given in table no.2.

**Table 2: Patient history**

S.N	Head	Patient details
1	PastHistory	Operative case of Neuroblastoma before 2 years back
2	Family History	Mother –Not significant
		Father – Not significant
3	Personal History	Sleep: 8-9 hours
		Appetite –good
		Bowels -1-2 times/day
		Micturation -4-5 times/day

**Examination**

In table no.3 details on Clinical examination and systematic Examination is depicted.

*AshtavidhaPariksha* are depicted in table no.4.

and clinical symptoms suggesting case of developmental delay.

**According to Ayurveda**

According to the symptoms and clinical features that have been described in Ayurveda textbooks. This can be Correlated with *Bala samvardhan janya vatavikruti*(5).

**SampraptiGhataka(6)**

- **Dosha**- TridoshaVataPradhana
- **Dushya**- Mamsa, Asthi, Majja, Rasa, Rakta,sandhi,
- **Updhatu**- Snayu,kandara,Sira
- **Srotas**- Pranavaha to Majjavaha
- **Srotodushti**- Vimargagamana,Sanga,
- **Vitiation dosha** -,Vishada,Ruksha, KharaGuna of Vata,, Tikshana, UshnaGuna of Pitta ,snigdha and sthiraguna of kapha
- **Agni**- Dhatwagni
- **Udbhavasthana**-Mastishka
- **Vyaktistana**–Ardhanga /Sarvanga

### Theraupatic interventions

Treatment details are given in Table no.5, 6,& 7 of *Shamana & bhrimhana Chikitsa*,and follow up medicine respectively.

**Table 5: Treatment: ShamanaChikitsa**

Sr. No.	1st setting 15/7/21 – 30/7/21	2 <sup>nd</sup> setting 7/11/21 - 22/11/21	Dose and Frequency	Duration	Anupana
1	<i>Ekgaveer Rasa</i>	<i>Ekgaveer Rasa</i>	1/4 twice a day	15 days	With Honey
2	<i>Swarnaprashana</i>	<i>Swarnaprashana</i>	8 drops Twice a day after meal	15 days	
3	<i>MaharasanadiKashayam</i>	<i>MaharasanadiKashayam</i>	5ml twice a day 1hr before meal	15 days	Water
4	<i>Kalyanakghrita</i>	<i>Kalyanakghrita</i>	10ml only	15 days	Lukewarm Water
5	-	<i>Manasamitravatakam</i>	½ tab twice aday after meal	15 days	Milk

**Table 6: Treatment: Bhrimhana Chikitsa**

Date 1 <sup>st</sup> setting	Date 2 <sup>nd</sup>	Procedure 1 <sup>st</sup> setting	2 <sup>nd</sup> setting	Drugs Used	Duration
15/7/21 -30/7/21	7/11/21 - 22/11/21	<i>PratiMarshaNasya</i>	<i>PratiMarshaNasya</i>	<i>Brahmi tail 1-1 each nostril</i>	15 days each
15/7/21 -21/7/21	7/11/21 - 13/11/21	<i>Shirodhara</i>	<i>Shirodhara</i>	<i>Brahmi Tail 500ml</i>	7 days each
15/7/21 -30/7/21	7/11/21 - 22/11/21	<i>SarvanagaAbhyanga</i>	<i>SarvanagaAbhyanga</i>	<i>DashmoolaTaila</i>	15 days each
15/7/21 - 30/7/21	7/11/21 - 22/11/21	<i>ShastiShaliPindaSwedana</i>	<i>ShastiShaliPindaSwedana</i>	<i>ShashtiShali Rice and Bala Powder</i>	15 days each
15/7/21 - 30/7/21	7/11/21 - 22/11/21	<i>Matrabasti</i>	<i>Matrabasti</i>	<i>DashmoolaTaila 10ml increasing upto 30 ml when</i>	15 days each setting

**Table 7: Follow up medicine**

Sl.no	1 <sup>st</sup> setting	2 <sup>nd</sup> setting	Dose & Frequency	Anupana
1	<i>Swarnaprashana</i>	<i>Swarnaprashana</i>	8 drops Twice a day after meal	
2	<i>MaharasanadiKashayam</i>	<i>MaharasanadiKashayam</i>	5ml twice a day 1hr before meal	Water
3	<i>Ekgaveer Rasa</i>	-	1/4 twice a day after food	With honey
4	-	<i>Manasamitravatakam</i>	½ tab twice aday after meal	With milk

### Observation and Results: (Diagnostic Assessment)

Before and after the treatment, the evaluations are conducted using validated scales, such as the GMFC shown in table No. 8. (7), Table No. 9 shows the modified ASHWORTH scale. (8), Table No.10, Activities of Daily Living (ADL) (9).Prior to treatment, the patient was unable to talk, walk without assistance, or stand without support. He can now stand, walk with support to a full extent, converse in some words, and he has improved to some level in his everyday activities as a result of treatment.

**Table 8:Assessment and Observations according to Gross Motor Function Classification Scale (GMFCS)**

S.N.	Name	Before Treatment	After Treatment-1 <sup>st</sup> sitting 15 July	After Treatment- 2 <sup>nd</sup> sitting 7 November
1	Sitting	Grade 2- sit for 30s & more lean forward	Grade 3- sit with back straight	Grade4- while sitting Can manipulate a toy
2	Standing	Grade 0- Does not stand at all	Grade1- Stand by holding a furniture	Grade 2- Take a few steps both hands hold
3	Fine Motor	Grade 1- Child try to reach and holds things with crude methods	Grade2- Child try to reach and holds things with very good grip	Grade3- From one hand to another hand can transfer object
4	Language	Grade2- Monosyllables	Grade 3- Bisyllables	Grade 4- Two words with meaning
5	Personal and social	Grade2- Recognizing mother	Grade 4- Attachment to toy and cry when is taking away	Grade 5- Resist when pulling the toy.

**Table 9: Assessment and Observations according to Modified Ashworth scale (MAS)**

Sl.no	Before treatment	1 <sup>st</sup> setting 15 July	2 <sup>nd</sup> setting 7 November
1	Grade 1+ - slight increase in muscle tone, minimal resistance through out the remainder ( less than half) of the range of motion.	Grade2- Increase in musle tone through most of the range of motion, but effected part easily move.	Grade3- Increase in muscle tone, but passive movement is difficult.

**Table 10: Assessment and Observations according to Activity of daily living (ADL) scale**

Sl. no	Activities Points (0-Dependent, 1- Independent)	Before treatment	1 <sup>st</sup> setting	2 <sup>nd</sup> setting
1	<b>BATHING</b> -washing face and able to take bath or showering by itself .	0	0	0
2	<b>DRESSING</b> -Able to select clothes and put it on without anyone help.	0	0	0
3	<b>TOILETING</b> -Ability to go toilet and cleaning it by oneself	0	0	0
4	<b>TRANSFERRING</b> - Can move from one position to another. E.g standing up from abed to chair.	0	0	1
5	<b>CONTINENCE</b> - controlling feelings and emotion	0	0	0
6	<b>FEEDING</b> - can feed by itself from a plate to mouth.	0	0	1

**TOTAL POINTS:   2   SCORING: 6 = High (patient independent) 0 = Low (patient very dependent)**

## Discussion

*Samvardhanavikara* is a *VataPradhana TridoshaVyadhi*. *Tridosha* become vitiated and take up residence in the body's *Raktastrotas*. Increased *rukshata* (dryness) is the main cause of developmental delay(10). In this situation, the vitiated vatadosha is the first condition to be addressed, and then *tridoshaghana* treatment was started

### Role of Shamana Chikitsa

- **Ekangaveer Rasa** –*Ekangaveer Rasa* possesses anti-inflammatory, analgesic, immune modulator, anti-bacterial, anti-atherosclerotic, anti-oxidant activities & anti-coagulant which produce its anti-arthritis effects (11). *Ekangaveer rasa* stimulate nerve, boost myelination as antioxidant, reducing ataxia, promotes fuctions in the muscle especially in the lower limbs.
- **Swarnaprashana** –*Swarnaprashana* act as immune-modulator activity, which produces immunity to the body (12). It helps in this patient by increasing his immunity, physical strength, enhancing memory and intelligent.
- **Kalyanakghrita** –*kalyanakghrita* possesses antioxidant, anti convulsion, anti depression, neuroleptic, neuro protective, anti-stress, anti-anxiety & nootropic activities. It is also acts as brain tonic (13). It helps in proper functioning of brain by these action of *Kalyanak ghrit*, improving concentration & digestion, boosting his cognition & immunity.
- **MaharasanadiKashayam**–*Maharasnadi Kashayam* possesses analgesic, anti-oxidant & anti-inflammatory activities which produces its anti-arthritis effects (14). Helps in improving the strength and functioning of his muscle, bones and joints by *Vatahara* action.
- **Manasamitravatakam**- *Manasamitravatakam* possesses anti-stress, anti-anxiety, anxiolytic, anti-depressant and neuroprotective activities (15). It is

improving speech, brain functions, concentration, memory and intelligence in this patient.

### Panchakarma chikitsa

- **Brahmi tail for Nasya**: *Nasya aushadhi* via nasal routes reaches to brain and acts on higher centres of brain, controlling different neurological, endocrinal and circulatory function. It clears the nasal passage and sinuses, relieves headaches, migraines, and all the diseases of the head .(16)
- **Shirodhara with Brahmi oil**: It helps to produce numerous neuro-transmitters in the brain that results in a dynamic psycho- somatic balance and relaxation of neuromuscular to relieve stress, anxiety, and intellectual disorders (17)
  - **MatraBasti with dashamoolatail**- It act as *Brumhana Karma*, It clears the obstructed channels and eliminate dryness from the body, it balances *Vata Dosha*, (18).
  - **ShashtikaShaliPindaSwedana**- It improve muscle strength, stimulates digestive fire and balances all three *Doshas*. (19).
  - Various studies that have been published that *Basti* is an effective treatment for *vata vyadhi* (20,21).

Physiotherapy exercises are shown in table No.11, It helps in increasing range of motion of lower limbs (22), helps in strengthen the leg muscle, squads, calves, glutes, hamstrings and helps in body balance(23), helps in strengthening the muscles of quadriceps, legs, lower back, and the knee joint, (24), strengthens hip flexors and Quadriceps muscle (25), strengthens hamstrings muscle, gluteus minimus, maximus, and medius(26), increasing range of motion (ROM) of elbow and shoulder(27), increases flexibility and range of motion of muscles. These exercises helps in strengthening and increasing range of motion and flexibility

**Table No.11: Physiotherapy Exercises**

S.N.	Exercise	Days
1	SLR(Straight Leg Raise)	15 Days each settings
2	Dynamic Squads	
3	BSS(Bulgarian split squad)	
4	Static ABS	
5	Heel Slides	
6	Bridging	
7	Reach out with left U/L Wt. bearing	
8	AA(Active assisted) ROM Shoulder and Elbow	

Treatment with *Shaman* medicine like *EKangaveerRasa*, *Swarnaprashana*, *kalyanakghrita*, *MaharasanadiKashayam*, *Manasamitravatakam*. *Nasya Karma*, *Shiroabhyanga*, provide significant results in diseases above the shoulder, *MatraBasti* with *Dashmoola* Oil was administered, which has *Vataghan* properties, having *Balya* (strengthening) and Purification properties. *ShashtikaShali Pinda Swedana* performed with Rice (*Shashti* rice) and *Bala* bolus and massage on the patient body with continuously dipped in the warm milk with *Balakwath*. As it is *balya* in nature. It helps in strengthening the muscle. There is a significant improvement in muscles. Now, the patient can stand and walk with support and now he can talk a few words. At a glance, here is the mention of shift in gradation before treatment and after treatment. The gross motor function is improving continuously and sitting milestone grade is changed from grade-2 to grade-4, standing from grade-0 to grade-2, fine motor from grade-1 to grade-3, language from grade-2 to grade-4, personal and social from grade-2 before treatment to grade-5 after treatment. Patient is still coming for follow-ups.

### Conclusion

In this case, the total impact was reported to be around 25–30%. As this condition is incurable, the improvement rate helps the patient to live a better quality of life. This case illustrates how Ayurveda is beneficial in controlling neuroblastoma complications and developmental delays. Furthermore, it demonstrates that treatment based on Ayurvedic principles and Panchakarma treatment regimens which has a stable and advantageous position in dealing with developmental delay.

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**Image No.1: showing improvement after and before**



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