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A Holistic Approach on Duchenne Muscular Dystrophy by Ayurvedic Treatment Modalities along with Traction: A Case Report

Case Report

Megha Dipak Rudey[1*], Renu Rathi[2], Bharat Rathi[3]

1. PG Scholar, 2. Guide and Professor, Kaumarbhritya Department,
3. Professor, Department of Rasashastra and Bhaishjya Kalpana,
Mahatma Gandhi Ayurved College Hospital and Research Center, Salod (Hi),
Datta Meghe Institute of Medical Sciences, Deemed to be University, Wardha. India.

Abstract

Background & Objectives- Duchenne muscular dystrophy (DMD) is individual and one of the most communal and serious condition come under childhood muscular dystrophies. The incidence of DMD is 1:3500 births of males. It is an X-linked recessive disorder that occurs due to deletion or alteration of dystrophin protein, which is encoded by DMD Gene on Xp21 chromosome. As per the view of Ayurveda, we can consider this disorder as chromosomal hereditary anomalies (*Bheejabhagahaavyava dushti janya Adibalapravtrutta vyadhi*). Main objective of this case report was to reduce the complaints of the patient and improve the quality of life. Method and Material- The present study is about the management of DMD as per Ayurveda perspective. An 11 years old male child, has complaints of difficulty in walking, frequent falls while walking, difficulty in sitting or squatting. On *Ayurvedic* management principles, the present case was managed with palliative care (*Shaman*) and bio-cleansing therapy (*Shodhana Chikitsa*). Result- After treatment, there was a significant improvement in complaints with signs and symptoms. Interpretation and conclusion- Though we are unable to rule out the disposition of genes through Ayurveda treatment modalities such as internal medicines, 5 detoxification procedures (*Panchakarma*) procedures, traction etc. we can effectively prolong the deterioration and improve the quality of life with correction in diet and lifestyle as per Ayurveda principles.

Key Words: *Bio-cleansing therapy, Chromosomal hereditary anomalies, Duchenne Muscular Dystrophy, Dystrophin, Traction, Xp21.*

Introduction

Duchenne Muscular Dystrophy was firstly termed and elaborated by Dr. Guillaume Benjamin Amand Duchenne (Neurologist, French) in 1860. It is a severe condition of muscular dystrophy which is generally found in childhood because of deletion or alteration of dystrophin protein, which is encoded by DMD gene on Xp21 chromosome. In this condition, dystrophin is entirely absent from its loci on the sub-sarcolemmal surface of muscle fiber. The prevalence rate of DMD is 1:3500 in male child birth (1). Generally, a large number of genetic abnormalities are due to deletion or mutation of gene anomaly. Females are the carriers in the affected families. The affected gene of DMD is made up of 79 exons, which encodes a maximum of 7 isoforms of protein dystrophin by using different promoters which are expressed in different tissues. Protein dystrophin is a major link between the cytoskeleton and extracellular matrix, which helps to steadies the muscle membrane in highly distortable muscle fibers (2). Deficiency of protein dystrophin is a major cause of failure of muscle fiber integrity and causes Myofiber necrosis, Fibrosis of muscles, the regenerative capacity of muscle failure, and this pathology leads to the occurrence of DMD. Serum creatine kinase levels are drastically raised much more than normal laboratory values. And also, the patient suffering from DMD has an average IQ level (3).

Clinically DMD is diagnosed over the age of 4-5 years of life, wheelchair dependency occurs by the age of 11-12 year of age of life and the progression is still the end of life (4). At the time of clinical manifestation of DMD, proximal-distal weakness is a typical confirmatory sign (5). Even at a young age, this muscle weakness is proof of struggle while uphill stairs, jumping & standing up after sitting up from the floor. The patient who is suffering from DMD, generally uses his hand to get up from the floor by touching the floor and taking support from the floor then from the thigh and then could stand which is known as Gower's sign (6). Another sign is Pseudo-muscular hypertrophy, in which calf muscles get enlarged to increase fibrosis and fatty replacement is there which leads to muscle fiber

*** Corresponding Author:**
Megha Dipak Rudey
PG Scholar, Kaumarbhritya Department, Mahatma Gandhi Ayurved College Hospital and Research Center, Salod (Hi), Datta Meghe Institute of Medical Sciences, Deemed to be University, Wardha India.
Email Id: megharudey121@gmail.com

hypertrophy. Along with these signs mild lordosis is common (7). Patient can survive above 20 years of their age but they mainly die because of respiratory failure or cardiac failure, as approximately 96% of patients who are suffering from DMD progresses to cardio-myopathies (8).

As per the view of Ayurveda, this condition comes under the chromosomal anomaly (*Beejabhag avayav dushti*), which is the major cause of vitiation of *Vata* in muscles (*Mamsa*) and Bone marrow (*Meda Dhatu*) and starts vitiation and depletion (9). Acharya Charak has clearly elaborated the direct relation between muscles and bone marrow which degrades and starts vitiation of muscles (10). Main objective of this case report was reduce the complaints of patient and improve the quality of life.

Materials & Methods

A 9 years boy was asymptomatic till the age of 6 years then he started feeling progressive slowness of movements of legs, generalized pain and muscular weakness. The patient was not able to stand own without support. Patient was complaining for increasing weight with reduced muscle power due to less movements by him. His parents were complaining that he was having difficulty in walking, climbing stairs, and running. Within 2 years, his symptoms became progressive, then he took physiotherapy in private hospitals but didn't get much relief, then he came to Ayurved hospital for admission, better management and lifestyle improvement. In total he received 3 sittings but with gap of one year due to Covid pandemic. After 1st sitting at Nov. 2020, he received 2nd sitting after one month gap and 3rd sitting received in Dec 2021with end in 10th Jan 2022.

Birth History

Antenatal - mother was suffering from Swine-flu during 2nd trimester of pregnancy & took modern medical treatment.

Natal - Lower uterine segment section, Birth weight-2.5 kg

Postnatal - Patient was not under NICU stay & mother was advised to feed after birth and got discharge after 8 days of the birth.

History of Past Illness - History of Typhoid at 6 years of age and he was admitted for 5-6 days for treatment

Family History - The child's grandfather was suffering from Diabetes Milletus for 3 years and he was on medication with a controlled blood sugar level. The hereditary disorder was not significant and consanguinity was present.

Dietary History - Mixed diet

Personal History -

- Appetite: Poor appetite
- Bowel: Irregular
- Urine: Normal (6 -7 times a day),
- Sleep: Disturbed sleep

History of Immunization - All routine vaccinations were given up to 5 years of age

General Examination -

General examination of 3rd sitting was noted herewith and observed that child was otherwise okay except mild anemia with Hb of 10.2 gm%.

- **Eyes**: Pallor
- **Nails**:-No clubbing
- **Skin**:-Normal
- **Tongue**: Uncoated
- **Pulse rate**: 78/min
- **RR**: 21/min
- **BP**: 100/70mmHg
- **Temperature**: Normal, afebrile

Systemic Examination -

In 3rd sitting also he had no any systemic findings.

- **Respiratory System -** No abnormality was detected. Air entry was bilaterally symmetrical.
- **Cardiovascular System** - S1 S2 Audible, No adventitious sound.
- **Digestive System -** Soft. No distention or organomegaly, No abnormality detected
- **Central Nervous System -** Conscious of time, person, and location. Cranial nerves were intact with its normal functions. The speech was normal and fluent. Higher functions like appearance, behavior, memory, orientation, and intelligence all were intact. He was studying in 5th standard with average rank.
- **Anthropometry** - Anthropometrical observations noted among all the 3 sitting of treatment period. This anthropometrical measurement was depicting the average growth and development and no protein energy malnutrition. (Table no. 1)

Table 1- Anthropometry on each sittings

Parameters	1st sitting	2nd sitting	3rd sitting
Weight	26 kg	26.8 kg	29.1 kg
Height	129 cm	130 cm	137 cm
Head Circumference	51 cm	52 cm	54 cm
Mid arm circumference	17 cm	17.5 cm	19 cm
Chest Circumference	59 cm	59.4 cm	61 cm

Components of manifestation of disease (*Samprapti Ghatak*)

- **Etiology *(Nidana)*:** Chromosomal abnormality on Xp21 chromosome (1) *(Vyadhi-Bheeja bhagaha avyava)* as the patients paternal uncle were affected by the DMD and scientifically this causes due to mutation of genes
- **Regulatory functional factor of body (*Dosha*):** *Dosha* which is responsible for movements and unctuousness of body *(Vata Kapha)*
- ***Vitiated parts (Dushya)*:** Muscles (*Mamsa*)
- **Affected body channels *(Strotas)*:** Channels carrying muscle tissue (*Mamasavaha*)
- **Place of origin (*Udbhavsthan*):** Lower extremities and later distal to proximal all over the body
- **Prognosis (*Sadhya/Asadhyata*):** Asadhya -Incurable

- **Metabolic Digestion (*Agni*)**: Depressed (*Manda*)
- **Undigested Toxins (*Ama*)** – Yes *(Sama)*

Diagnosis

This patient was already diagnosed with DMD (Mamsajanya Vata/ Mamsashosha), and repeated increase in Serum CK enzyme levels was a subtle sign of active Duchenne muscular dystrophy.

Treatment

According to Ayurveda, *Mamsa Dhatvagnimandya* takes place here that res, resulting in the Mamsa shosha in DMD and of *Vata* and *Kapha Dosha*. Therefore, *Vata-Kapha Shamaka*, *Dhatwagnimandyahara* rejuvenating treatment was planned for this case.

First Sitting: First sitting was given for 14 days to the patient. The same medication (11) was given after discharge for 1 month except *Laghumalini vasant*. Physiotherapy was also advised to perform at home. In this treatment sitting, the patient has received internal medication to get relief from symptoms. Along with this he has received *Panchkarma* therapy and physiotherapy, which showed good improvement in patient. This table gives detailed information about the *Panchkarma* therapy ingredients and also doses and *Anupana* of internal medication given (Table 2) He came later for follow-up after 1 month for 2nd sitting.

Table 2- Treatment for first sitting (Date 08/09/2020)

External Therapy (12)		
Therapy	**Ingredients**	**Duration**
Whole body dry powder massage (*Sarvanga utsadan*)	*Dashamoola Taila & triphala churna*	For the first 3 days
Sudation by application of medicated herbal powder *(Upanaha*)	*Vacha* (Sweet flag),*Rasna* (Lesser galanga), *Ashwagandha* (Indian winter cherry), *Wheat Powder, Erandapatra* (Castar plant leaf).	14 days
Fomentation with the help of rubber tube (*Nadi swedana)*	*Dashmoola kwath*	For first 3 days
Sudation with specially prepared bolus of drugs (*Pindaswedana)*	*Shashtishali rice*	for 14 days
Therapeuticenema*(Matrabasti)*	*Dashmoola taila* with pinch of *saindhav lavana*	For 14 days
Nasal drop (*Nasya*)	*Panchendriya vardhan Tail* 2 drops	For 14 days
Physiotherapy and traction	Passively by therapist	For 14 days
Internal medication (13)		
Formulation	**Dose**	**Given with**
Ashwagandha churna	3 gm BD	Luke warm water
Asthiposhak Vati	1 Tab BD	Luke warm water for 5 days
Lakshamivilas Rasa	1 Tab BD	Luke warm water
Suvarna prashana	10 drops BD	Bramhi Ghee
Amyron syrup	10 ml BD	Water
Saptamrita Lauha	1 Tab BD	Luke warm water
Cap Ferich	1 Cap BD	Luke warm water

Second Sitting: after 1 month patient came for follow-up for next treatment plan. Table no. 3 illuminates about the 2nd sitting of treatment strategy. In this sitting, patient has received internal medications for pacification of *Dosha* and complaints. Along with this he has received *Panchkarma* therapy and physiotherapy which showed improvement in the muscle power and muscle weakness was reduced. This treatment strategy was planned for 14 days. Physiotherapy was advised to the patient at home. (Table no. 3)

Table 3: Treatment for second sitting (10/10/2020)

External Therapy		
Therapy	**Ingredients**	**Duration**
Whole body dry powder massage (*Sarvanga utsadan*)	*Dashamoola Taila & Triphala churna*	For first 3 days
Sudation by application of medicated herbal powder *(Upanaha*)	*Vacha* (Sweet flag),*Rasna* (Lesser galanga), *Ashwagandha* (Indian winter cherry), *Wheat Powder, Erandapatra* (Castar plant leaf).	14 days
Fomentation with the help of rubber tube (*Nadi swedana)*	*Dashmoola kwath*	For first 3 days
Sudation with specially prepared bolus of drugs (*Pindaswedana)*	*Shashtishali* rice	for 14 days
Therapeutic enema using bone marrow (*Majjabasti*)	Bone marrow of goat with milk (40 ml) *Bala, Rasna, Ashwagandha* with 10 ml of *Panchtikta Ghrita.* (50 ml)	
Sudation with specially prepared bolus of medicinal leaves (*Patrapottaliswedana*)	*Nirgundi, Nimba, Arka, Bilva patra*	SOS
Physiotherapy and traction	Passive	Continuous

Internal medication		
Formulation	**Dose**	**Given with**
Shankha Vati	1 Tab BD	Luke Warm Water
Panchtikta Ghirta	10 ml BD	Luke Warm Water
Dashamoolarishta +Ashwagandha Churna	10 ml BD	Luke Warm Water
Kumarbharan rasa 200 mg+Trikatu300mg+Triphala Churna 500mg +Ashwagandha Churna 19 gm+Guduchi satva 200mg	1/4 Tab BD	Honey
Asthiposhak Vati	1 Tab BD	Lukewarm water
Cap Ferich	1 Cap BD	Water

Third sitting- As there was covid 19 pandemic on going patient didn't came for follow-up. He came for follow-up after approximately 1 year for the next treatment plan. At this interval of treatment, patient continued oral medication which was prescribed in second sitting. In table no. 4, treatment plan for 3rd sitting is given by internal medications, physiotherapy and *Panchkarma* therapy for 14 days. (Table no. 4)

Table no. 4– Third sitting of treatment (07/09/2022)

External Therapy		
Therapy	***Ingredients***	**Duration**
Whole body dry powder massage (*Sarvanga utsadan*)	*Dashamoola Taila & Triphala churna*	For first 3 days
Sudation by application of medicated herbal powder *(Upanaha*)	*Vacha* (Sweet flag),*Rasna* (Lesser galanga), *Ashwagandha* (Indian winter cherry), *Wheat Powder, Erandapatra* (Castar plant leaf).	14 days
Fomentation with the help of rubber tube (*Nadi swedana)*	*Dashmoola kwath*	For first 3 days
Sudation with specially prepared bolus of drugs (*Pindaswedana)*	*Shashtishali rice*	for 14 days
Therapeutic enema using bone marrow (*Majjabasti*)	Bone marrow of goat with milk (40 ml) *Bala*, *Rasna*, *Ashwagandha* with 10 ml of *Panchtikta Ghrita*. (50 ml)	
Sudation with specially prepared bolus of medicinal leaves (*Patrapottaliswedana*)	*Nirgundi, Nimba, Arka, Bilva patra*	SOS
Physiotherapy and traction	Passive	Continuous
Internal medication		
Formulation	**Dose**	**Given with**
Shankha Vati	1 Tab BD	Luke Warm Water
Panchtikta Ghirta	10 ml BD	Luke Warm Water
Krumikuhar Rasa	1 Tab BD	Lukewarm water
Dashamoolarishta +Ashwagandha Churna	10 ml BD	Luke Warm Water
Kumarbharan rasa 200 mg+Trikatu300mg+Triphala Churna 500mg +Ashwagandha Churna 19 gm+Guduchi satva 200mg	1/4 Tab BD	Honey
Asthiposhak Vati	1 Tab BD	Lukewarm water
Cap Ferich	1 Cap BD	Water

Result

Post Treatment Assessment: the neurological assessment which was observed before starting the treatment strategy and after 3rd sitting. This table has showed the detail evaluation of pre assessment and post assessment of reflexes, muscle power and muscle tone of both limbs and its observed value are noted. (Table 5) also image number 1 & 2 shows the improvement in performing activities and traction.

Table 5: Neurological assessment

	First sitting		**Second sitting**		**Third sitting**	
	Reflexes (Grades of reflex intensity)					
	Right limb	**Left limb**	**Right limb**	**Left limb**	**Right limb**	**Left limb**
Biceps	3	3	2	2	2	2
Triceps	3	3	2	2	2	2
Knee	3	3	2	2	2	3
Ankle	3	3	2	2	2	3
Plantar	3	3	2	2	2	3
Muscle Power						
Upper	2/5	3/5	2/5	3/5	4/5	4/5
Lower	3/5	3/5	3/5	3/5	4/5	4/5
Muscle Tone						
Upper	Hypertonia	Hypertonia	Hypertonia	Hypertonia	Normotonic	Normotonic
Lower	Hypertonia	Hypertonia	Hypertonia	Hypertonia	Slight	Slight

Walking- Moderately improved
Standing up from sitting position- Slight progress
Walking upstairs- No progress
Falls- Significantly improved

Discussion

It has been observed that there is good result of *Panchkarma* in DMD (14, 15). Whole body massage with dry powder (*Sarvangautsadana*) simulates receptors of skin also progresses blood circulation which increases the blood flow and enhances cell activity, vasodilation which provides nourishment and increases the strength of muscles (16), and helps in the reduction rate of thickening of connective tissues along with this it reduces the fibrous adhesions of injuries of muscle tissue to improve flexibility (17). Dry powder massage played a major role to reduce toe walking, there was a noticeable improvement in atrophied muscles and also muscle power with muscle tone was improved at the time of follow-up (18). Giving sudation and providing heat to the skin reduces the gamma activity of the stretched muscle, which will reduce the stretch of muscle receptors too. This indirect method of providing heat over skin indirectly shows reduced alpha motor neurons which helps in reducing muscle spasms. Increasing temperature over muscles also increases the strength and stamina. Sudation also helps to reduce joint stiffness and increases tissue extensibility and improves ROM (19).

A therapeutic enema (*Basti*) is the procedure that specifically shows two actions, i.e. expulsion of vitiated *Doshas* from the body and nourishing body as it is also mentioned in *Gambhirgata Vata* too (20). Drugs of therapeutic enema get absorbed in the colon and show their systemic action. Also, it easily excretes *mala* which is majorly accountable for the disease process (21). This therapeutic procedure especially provides strength, which doesn't require any strict scheduled diet and also easily eliminates urine, stool and vitiated *doshas*. It reduces the *Vata Dosha* and improves and provides therapeutic nourishment (*Brimhana*) and its functioning (22).

Sudation with specially formed bolus of medicinal drugs like *Shashtishali Pindaswedana* provides relaxation to constricted stiffed muscles while providing tonicity to the body (23). Essentially it increases the metabolic rate by improving blood circulation and oxygen flow in body also stimulates the sweat gland and nerves. This results in reducing stiffened muscles and stimulates for mobility (24). Therapeutic enema has containing Physical strengthening yoga (25) improves the strength in muscles and provided nourishment to contracted joints and muscles also it helped to maintain the equilibrium between mind and body which was much needed to improve positivity and moral support for daily routine life (26). Lumbar traction by increasing weight improved the strength of calf muscles and lower limb. It also helps to correct the posture of spine and body (27). It helped to reduce the scoliosis as seen in image 1.

Conclusion

This present case study was planned to improve the functional and physical capacity of activity, reduce the rate of disability to interrupt further evolution or development of disease and helps to retain the process of ambulation for a longer period of time along with it this improved quality of life and activities of daily routine life. In this case, it is found that the treatment was approximately 35-45% was effective. As this disease is not curable, this treatment showed there is improvement in his daily living activities and improved quality of life.

Images

Image 1 – Traction given to patient.
Image 2 - Riding physio-cycle to enhance motor function

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Conflict of interest- None

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