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CASE REPORT

UNDERSTANDING BECKER MUSCULAR DYSTROPHY THROUGH AYURVEDA- A Case Report

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Abstract

Muscles are a band of fibrous tissue in an animal body that can contract, produce movements, and maintain the position of different parts of the body. Myopathies are disorders with structural or functional impairment of muscle. There are majorly 3 types of muscles: Skeletal, Cardiac, and Smooth muscles. Muscular dystrophy(MD) is a group of progressive hereditary degenerative diseases of skeletal muscles. The main cause of Muscular dystrophy is the mutation of the gene which is responsible for healthy muscle function and structure. The most common symptoms are frequent falls, difficulty in rising from sitting or lying posture, trouble in walking and running, waddling gait, large calf muscles, muscle pain and stiffness, learning abilities, etc. Diagnosis is mainly done by checking the level of creatine kinase in blood. Also, genetic tests, Muscle biopsy, and Electromyography (EMG) are used as investigative tools in Muscular dystrophy. Physical and nonoccupational therapies, corticosteroids, mobility aids, heart and respiratory care, and speech therapies are done in conventional practice to improve the quality of life. In *Ayurveda*, MD can be broadly correlated with *karsyatha* and *mamsa sosha* which is mentioned as a symptom in *mamsavaha sroto vidhalakshana* by *Acharya Susrutha*. *Laghu,santharpana ahara*, and *mamsa prayoga* are the best methods to address the condition. Along with this *bahya chikitsa* and *sodhana* is very important to prolong the effect of treatment.

This article is a case report on Beckers Muscular Dystrophy where the patient was born into a consanguineous marriage and started to develop symptoms like weakness of the lower limb, difficulty in getting up from sitting posture, and frequent falling from the age of 10. He was diagnosed with elevated Creatine kinase level in his blood at the age of 18 and underwent OP management in both Allopathic and *Ayurveda* medicine for 6 months. Here he was given *Deepana, Pachana, Srotosodhana, Sodhana*, *Brhmana, and Rasayana* line of management. During the period of treatment, his weakness in lower limbs and quality of life improved. The outcomes were assessed using DMD-QOL-8D-pre and post-treatment assessment, Muscular Dystrophy -Brooke scale for upper extremity, and Vignos scale for lower extremity and muscle bulk. Even though there is no known cure for MD, *Ayurveda* helps improve the quality of life and slows down the progression of the disease effectively

Introduction

Myopathies are any muscle disease that occurs primarily due to structural or functional impairment of muscle[1]. There are 2 types of myopathies-hereditary and acquired. Muscular dystrophy comes under the hereditary type of myopathies.

Myopathies are characterized as progressive muscle weakness and degeneration with subsequent replacement by fibrous and fatty tissues[2].

PATHOGENESIS

Dystrophin:

It is a protein that attaches to the sarcomere and cell membrane. It gives support to muscle cells. It connects to actin and attaches to B-dystroglycan embedded in the sarcolemma[3]. When attached to connective tissue, the protein B-dystroglycan allows the force generated by sarcomere shortening to transmit to the entire muscles effectively. In the absence of dystrophin, this force cannot effectively be transmitted to the entire muscle, resulting in muscle weakness. Persons who have no dystrophin muscle cells will be weak and can easily break down sarcolemma, cells thus become leaky and enzyme kinase will leak through the cell membrane to ECF and blood[4]. Leaking kinase in blood is a sign of damage to muscle cells and hence measuring the level of this enzyme is a major diagnostic tool.

Becker muscular dystrophy (BMD):

BMD is a milder form and is closely related to DMD clinically, genetically, and ultra-structurally[6]. It comes under the X-linked trait of muscular dystrophy and the onset is in later age like 12 years. The boys with BMD walk well into adult life[7]. Features like mental retardation, cardiomyopathies, and kyphoscoliosis are uncommon. Respiratory involvement occurs in late stages and death before 2nd decade is rare.

DIAGNOSIS

Enzyme tests like CK in blood and genetic testing are done to analyze gene mutation. Muscle biopsy electrocardiography, and electromyography can all be conducted to diagnose and confirm muscular dystrophy[8]. A clinical diagnosis of myopathy is made when there is muscle pain or weakness accompanied by a creatine kinase (CK) level more than ten times the upper limit of normal

TREATMENT

Although there is no permanent cure for MD, some treatments can help to extend the time of person and complications. certain medicines like prednisone can help in muscle strengthening and delay the progression of muscular dystrophy. Cardiac medications like ACE inhibitors or beta blockers are used to prevent damage to cardiac muscles. Recently Golodirsen has been used for treatment in Duchenne dystrophy with certain genetic mutation[10].On long-term use this results in weight gain, weakened bones, increased fracture risk etc.

Ayurveda is the oldest and traditional system of medicine that is accepted worldwide. *Ayurveda* has survived and flourished for ages to date. *Ayurveda* means the knowledge of life and is a precise combination of science and the art of living. According to *Ayurveda, samadosha,samadathu*, and *samagni* are essential for the maintenance of a healthy life[11]. Impairment in any of these factors results in numerous diseases. Muscular dystrophy is considered *mamsa sosha* in *Ayurveda* where there is derangement in the *agni at the dathu* level and prevents the nourishment of *utharothara dathus.* Also, there is an imbalance in the normalcy of *tridosas* and *saptadathus. Ayurveda* not only emphasizes curing the disease but also preventing it.

- The patient was born as the first child of a consanguineous marriage and noticed delayed milestones of development like standing at 1 1/2 of age, and speech at 2 years of He was under OP management there. Last 4 months he has noticed difficulty in breathing while lying down. He also has difficulty swallowing food at times. Now he is admitted here to address the above-mentioned conditions. Also, he noticed an involuntary sound irrespective He was under OP management there. Last 4 months he has noticed difficulty in breathing while lying down. He also has difficulty swallowing food at times. Now he is admitted here to address the above-mentioned conditions. Also, he notices an involuntary sound irrespective parents had not been with him since childhood as they had to move to Kerala as part of their work. He was raised by his grandparents. They did not notice his walking difficulty or posture deformity. As per the patient, he was not able to take part in any physical activities like sports since childhood. When he tried to play or run he tended to fall (from 5 th std). Due to this he never used to take part in any activities. He started noticing his difficulty in walking and running after 8 years of age. When he was 10 years of age he slowly started to develop difficulty in climbing steps, difficulty in getting up from a sitting posture, and gait abnormalities like swaying backwards.3 years back, during the COVID pandemic when his parents came to stay with him they noticed his difficulties and took him to an allopathic hospital. They advised him of oral medications and exercises details regarding this are available with the patient at present. As they found no

change he took consultation with an Ayurvedic physician in Thodupuzha (6 months). He was suggested for blood investigations which revealed raised Creatine kinase (8855u/l). He was under OP management there. Last 4 months he has noticed difficulty in breathing while lying down. He also has difficulty swallowing food at times. Now he is admitted here to address the above -mentioned conditions. Also, he notices an involuntary sound irrespective of time, and posture position and breathes heavily on walking. It is noticed better and asked by people sitting near him. As per the patient and his family members, no other children in their family had a history of similar conditions.

HISTORY OF PAST ILLNESS

1. Delayed milestones no other significant history of this disease.

a. Standing-1 ½ years

b. Walking -2 years of age

c. Speech-2 years of age

FAMILY HISTORY

He is the first son of a consanguineous marriage.

No other relevant history of the disease.

PERSONAL HISTORY

- Diet : Breakfast: Pongal, idly
  Lunch: Rice, Curry
  Dinner: Rice, Chappati, Dosa
- Prefers non vegetarian diet
- Bowel: regular, once per day, normal consistency
- Appetite: good
- Micturition: 4-5 times in the daytime
- Sleep: Sound
- Allergies: Nil
- Habits: nil
- Addictions: nil

MOTOR SYSTEM EXAMINATION

Involuntary movements – absent

Fasciculation- absent

Muscle bulk	Rt	Left
Biceps	26cm	27cm
Forearm	25cm	26cm
Thigh	41 cm	43 cm
Calf	34cm	35 cm
Muscle tone	**Rt**	**Left**
upper limb	Normotonic	Normotonic
Lower limb	Normotonic	Normotonic
Muscle power	**Rt**	**Left**
Elbow-flexion	G4	G4
Extension	G5	G5
Wrist-Flexion	G4	G4
Extension	G4	G4
Shoulder-Abduction	G3	G3
Adduction	G3	G3
Finger abduction	G4	G4
Hip-Flexion	G4	G4
Extension	G4	G4
Knee flexion	G4	G4
Extension	G4	G4
Ankle dorsi flexion	G4	G4
Plantar flexion	G4	G4
Biceps	+	+
Triceps	+	+
Knee	+	+
Ankle	++	++
Plantar reflex	Normal	Normal

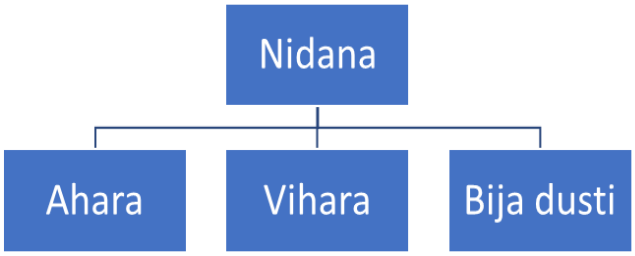
RESPIRATORY EXAMINATION

- Shape of chest-symmetrical
- Respiratory rate-36/min
- Palpation: Position of Trachea-Midline
- Lymph node-no enlargement
- Short, rapid shallow breath
- Expansion-2 cm
- Auscultation-No wheezing

INVESTIGATION

- On 24/9/2022- Creatine kinase (CK)-8855u/l;
- Creatine kinase MB:(CKMB)-55.6ng/ml (0-3.38)
- On 28/10/2022-CK-5071u/l;
- CKMB-39.6ng/ml
- On 26/11/2022-CK-5279u/l
- On 25/01/23 – CK-10549u/l
- 07/02/2023- T. Cholestrol-228mg%
- S. Triglyceride-210mg%
- Hb-14.1gm%
- WBC-7200cells/cm

NIDANA



AHARA: *Guru, abhishyandi ahara* like *dadhi*

VIHARA: *Ratrijagarana*

BIJA DUSTI: Son in a consanguineous marriage

SAMPRAPTI

- *Adibalapravrdha vyadhi-Bijadusti in mamsa*
- *Guru abhishyandhi ahara- Kapha vridhi*
- *Ratrijagarana- Vata vridhi*

- Results in *avarana*:
- *Kaphavrta prana-Niswasa uchwasa sanga*
- *Kaphavrta udana-bala pranasa*
- *Kaphavrta vyana-Skalithagati*
- *Dathwagnimandhya-Rasasamvahana* impaired-*Utharothara dathu poshana is affected leading to sosha*
- *Dosha karmaja*

DIAGNOSTIC ASSESSMENT

DIFFERENTIAL DIAGNOSIS

- *Ayurveda*: *Karshyata*-Sushka sphik udara greeva dhamani jala santhatha

  Twak asthi sosha atikrisha sthoola parvo nara matha[12] *(Cha Su)*

  Pangu- Vayu katyam sthitha sakthna kandaram akshipet yatha

  Thatha kanjo bavet janthum pangu sakthno dwayorapi (AH.Ni)

  Phakka-Bala samvatsarat padebyo yo na gachathi
- Modern: DMD: Mental retardation, Death prognosis

METHODOLOGY/ TREATMENT GIVEN

THERAPEUTIC INTERVENTION:

Treatment adopted:

- *Agnideepana*
- *Srotosodhana*
- *Vatahara*
- *Balya*
- *Sthairyakara*

INTERNAL MEDICATIONS

DAYS	NO	NAME OF MEDICINE WITH DOSE AND TIME OF ADMINISTRATION	REMARKS
7	1	• *Gandharvahasthadi kashayam-90 ml bd* • *Vaiswanara churna-5gm with kashaya*	*Ama pachana*
7	2	• *Gandharvahastadi ks+Vaiwanara churnam-Continue*	
7	3	• *Bhadradarvadi kashayam+ sthira ks-90 ml bd*	*Kashaya which is vatahara and balavardhana*
14	4	• *Dhanwantharam ks +Dhanwantharam 101 avarthi -5 drops* • *Ashwagandha ghrtam-1 tsp at night with hot water before bed*	*Brhmana and balavardhaka*

BAHYA CHIKITSA

DAYS	NO	TREATMENT AND MEDICINE USED	REMARKS
14	1	*Udwarthana with Kolakulathadi churnam-7 days (added Jeevanthyadi churna after 3 days)*	Lightness of body. Movements improved.
7	2	*Utsadanam-Jeevanthyadi churnam+Bhadradarvadi kashayam*	Symptoms felt aggravating. tiredness
7	3	*JPS-Thaila-Satahwadi tailam+Kottamchukkadi tailam*	Back pain was reduced considerably
1	4	*Mridu Virechana-Gandharverandam :20 ml with usna jala* *Peyadi krama for 2 days*	The patient was stable.6 vegas
7	5	*Shashtika pinda sweda-adhakaya*	Bala on sitting down and getting up, climbing stairs

DISCHARGE MEDICINE

1. *Dhanwantharam kashayam*-90 ml, bd, one hour before food

2. *Dhanwantharam* 101 A-10 drops with kashayam

3. *Ashwagandha churnam*-3gm with milk at night

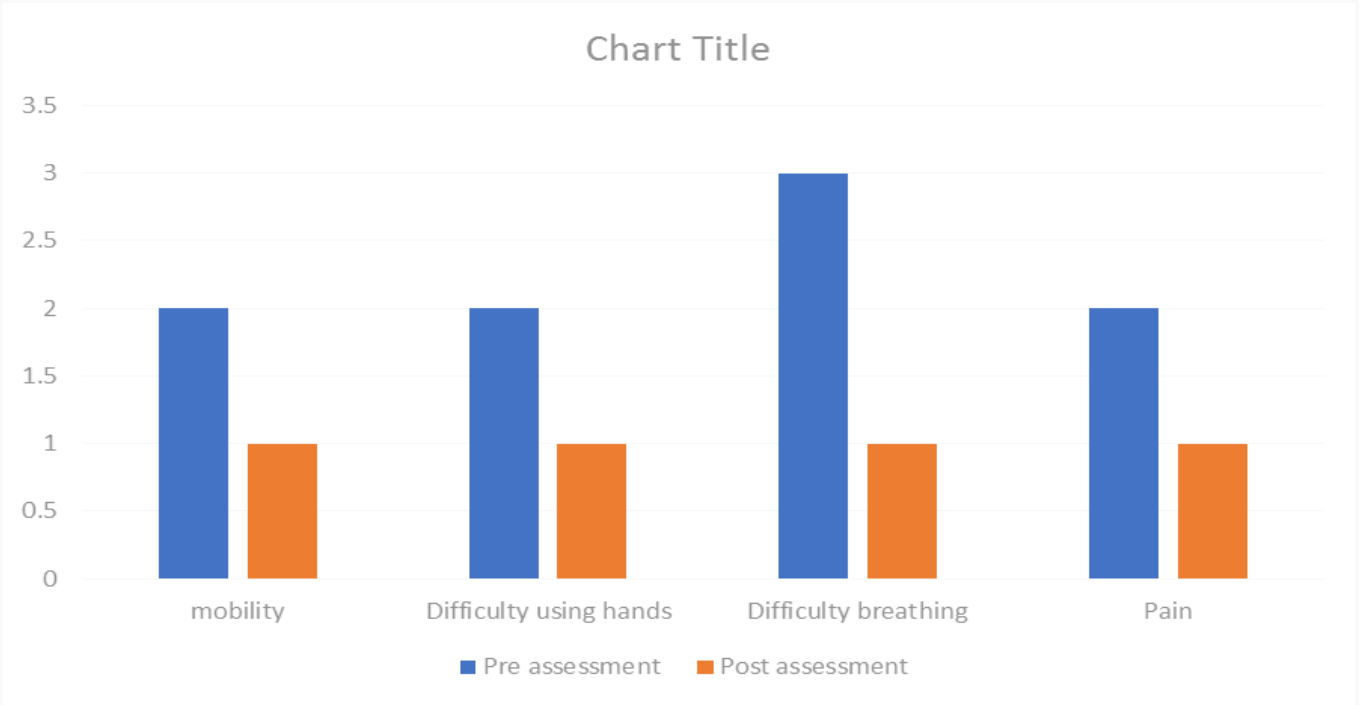
4.*Chyavanaprasa*-1 tsp followed by ¼ glass hot water, before bed

RESULTS

The patient was given *ama pachana* and *langana* therapies initially which gave lightness to the body and ease in movements of the joints. As the patient had back pain *Gandharvahastadi Kashaya* was continued and treatment like *JPS* was given which reduced his back pain and stiffness of low back. *Virechana* was done to remove the *dosa* which is brought to *koshta* by *snigdha kriya*. Later *brhmana chikitsa* with *Dhanwantaram kashayam* and *Dhanwantaram* 101 A and *Shashtika pinda sweda* was given which improved his weakness and difficulty to walk. Frequent falls also was controlled. His muscle strength also considerably improved. The CPK level on admission was10549u/l. At the time of discharge, the CPK value was reduced to 3768.16 u/l. The pain, difficulty using hands, difficulty breathing and mobility were assessed using DMD-QOL-8D-PRE AND POST-TREATMENT ASSESSMENT SCALE and showed improvement post treatment.

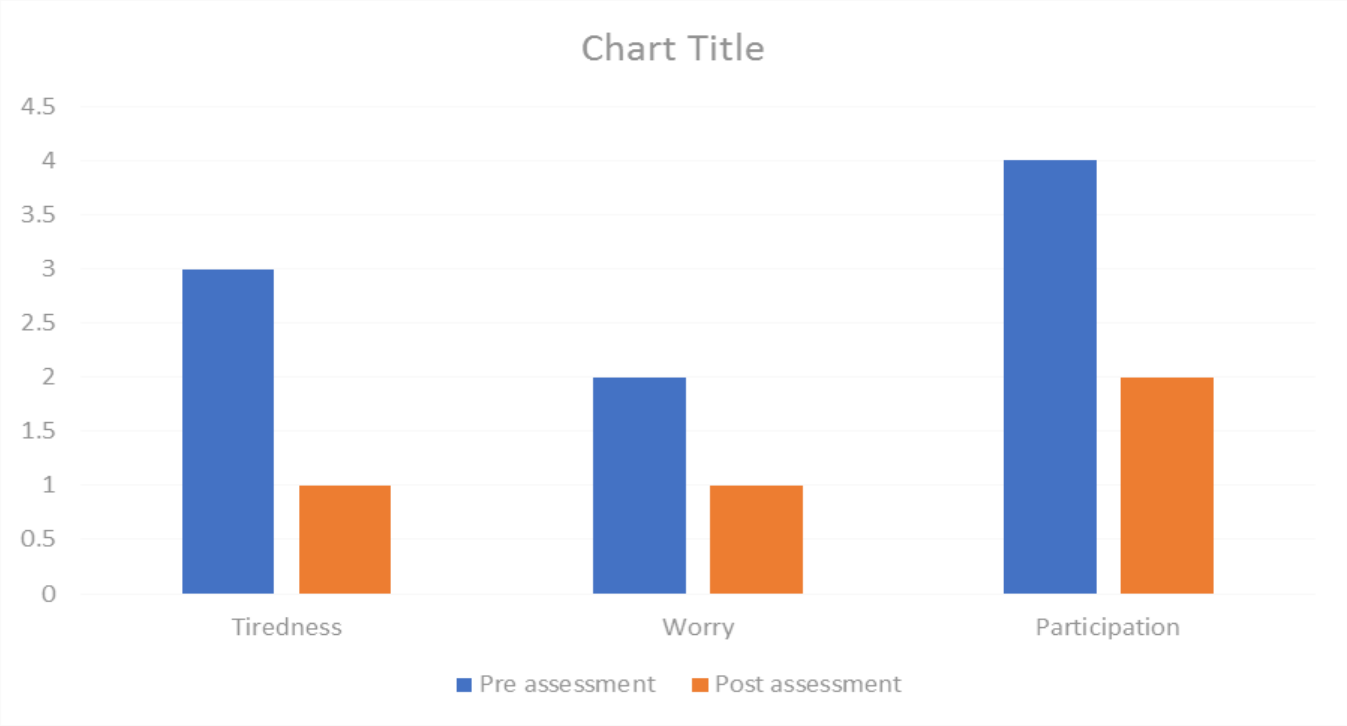
1.TREATMENT OUTCOME:

DMD-QOL-8D-PRE AND POST-TREATMENT ASSESSMENT

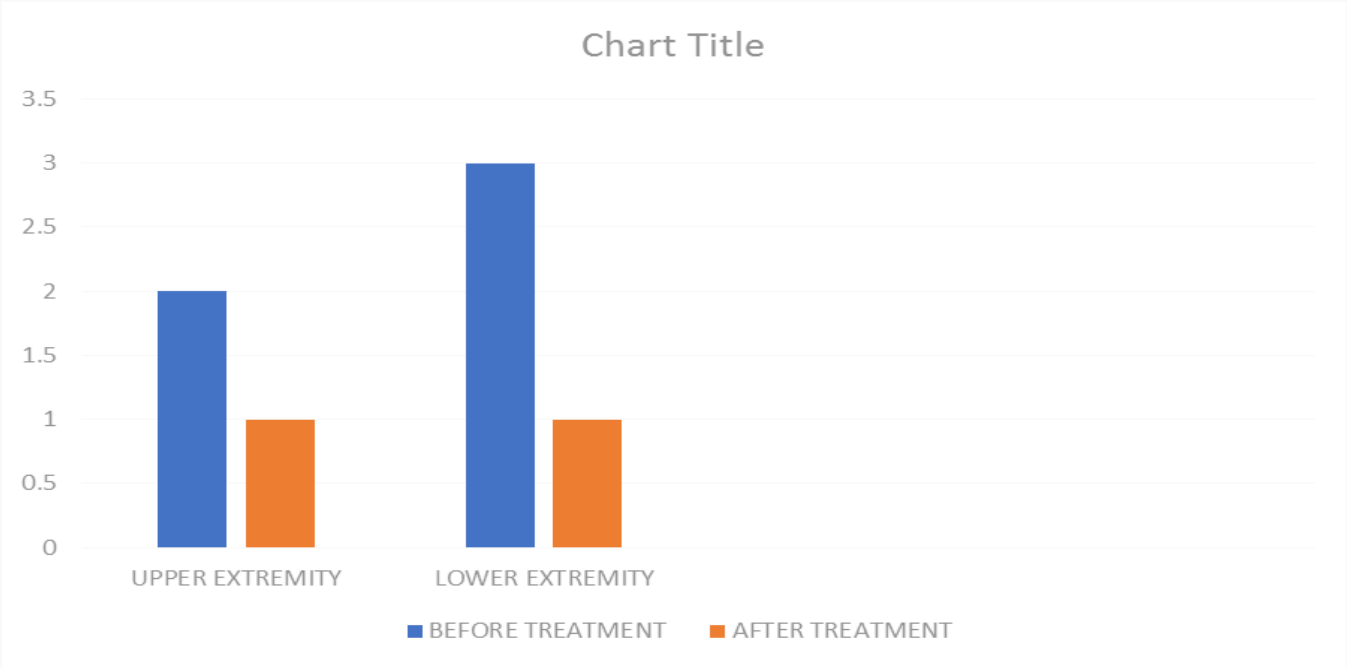


DISCUSSION

Muscular dystrophy refers to a group of genetic conditions that cause muscle weakness and related symptoms. The symptoms of muscular dystrophy worsen over time. It may develop at birth, in childhood, adulthood, etc depending on the type. The symptoms worsen with time and the death is often related to respiratory muscle failure. Unfortunately, currently, there is no cure for muscular dystrophy. The main goal of treatment focuses on symptom management and improving the quality of life. Here *Ayurvedic* management has a vital role to play. The conventional treatment methods include the use of steroids, exercises, physiotherapy, and mobility aids. *Ayurvedic* management is very effective in preventing the worsening of symptoms and improving the quality of life without any side effects.



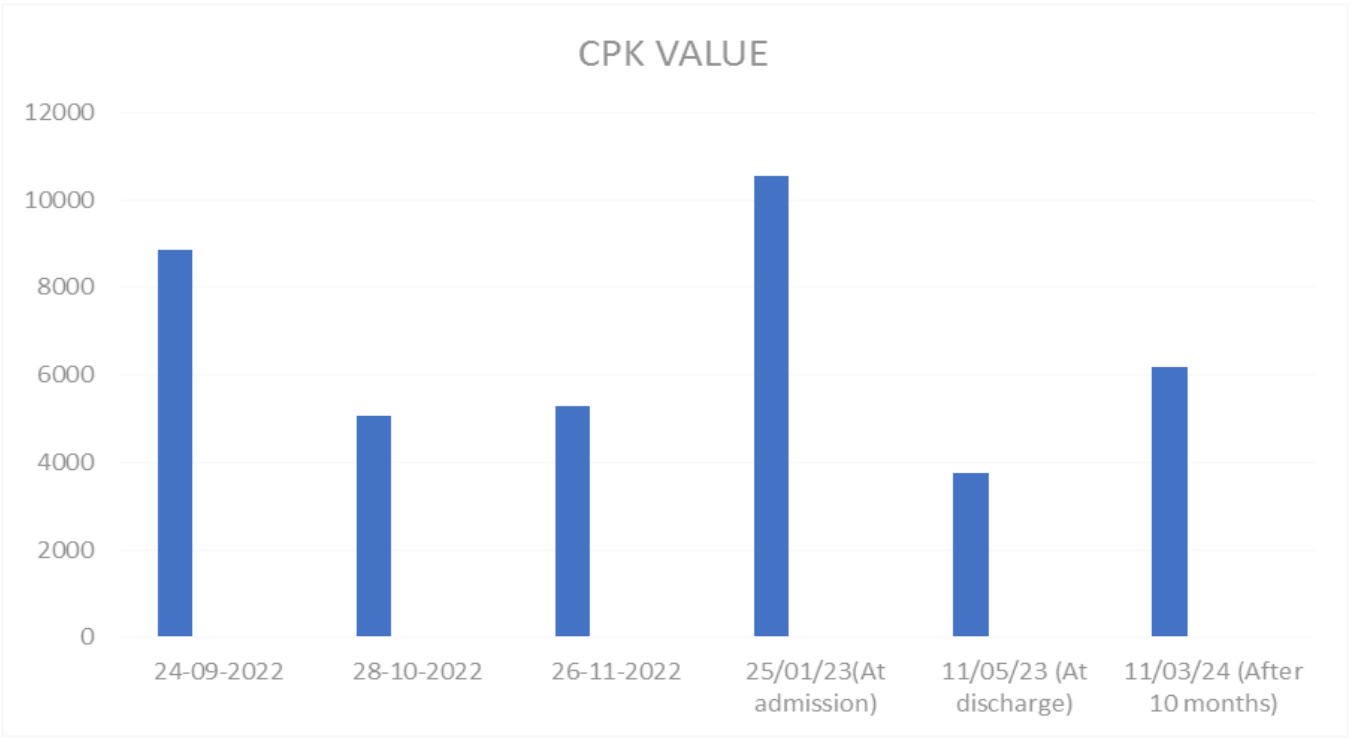
In *Ayurveda*, this condition is considered as a *Sahaja vyadhi*. Even though it is considered *asadhya*, *Ayurvedic* management helps in slowing down the further progression of the disease. Both *ama pachana* and *agni deepana* comprise the initial phase of management in this case as this is *Sahaja vyadhi* and there is the presence of *Sahaja ama*. The pathology occurs in the form of *dathwagni mandhya* and hence *agni deepana* is very important. *Srotosodhana* helps in removing the leena dosa and thereby paves the way for the medicines to get to the deeper targets and helps to acquire the best effects of that drug. Using balya and sthairyakara drugs helps in improving the bala and preventing further depletion of dathus. The CPK level may be regarded as dhatupakavastha of mamsa dhatu. As a result of *dhatwagni mandya*, *vrudhi* is attained in a *vikrutavastha* of *mamsa dathu*. *Agnimandhya* is considered the root cause of all the diseases where proper metabolism is deranged and results in formation of *ama*. As the derangement is seen till the *datwagni* level here along with *Deepana pachana*,*srotosodhana* drugs also play a vital role. This can be addressed with the use of *Vaiswanara churna* and *Gandharvahastadi Kashaya* which was given initially here. Externally *udwartana* was done with *kolakulathadi churnam* which is *kaphahara* and acts as *mrdu langana* for 3 days. To reduce *vata vardhana* and *rookshata* from the fourth day *Jeevanthyadi churna*.In the second phase, *Badradarvadi Kashaya* which is again *vatahara* and external *utsadana* was given with *Jeevanthydai churna* which is mentioned in *Sosha chikitsaadhikara* which is *balya* and reduces the *vata vridhi* caused by *udwarthana*.As the patient complaints of low back ache as a part of his posture change *JPS* was done.More swedana was not done as it can worsen the *dathu paka Avastha* in this condition. *Virechana* with Gandharveranda *tailam* -20 ml with hot water and had 8 vegas. The patient was given 2 days' rest with *peyadi karma*. Later *brhmana kriya – Shasthika pinda sweda* was given which imparts *bala* to *dathus*. Internally *Dhanwantaram ks with Dhanwantaram* 101 (10 drops) was given which is again *balya* and *sthairyakara*. *Aswagandhadi ghrtam* is considered balsa, improves *dathu bala*, and reduces general debility. Later on discharge, the same *kashayam* was asked to continue. The usage of *Rasayana* can help in the optimization of *dathus*. *Rasayana Ashwagandha churnam* in 3 gm with milk was asked to be taken at night time. *Chyavanaprasa* was asked to take on alternate days. Most of the ingredients in *Chyavanaprasa* act as *dathu balavardhaka* and are considered "*balanam angavardhanam*". With all these patient was asked to revisit after 2 months. The patient noticed an improvement in quality of life he was able to walk without support, felt better about climbing stairs, and was able to travel by bus to college alone. His back pain was also considerably reduced. After the revisit, he was asked to continue the medication for another 2 months. His symptoms did not worsen and his quality of life improved. After 6 months his muscle bulk was again noted and did not find any further depletion or wasting of muscles. While *Ayurveda* treats disease at its root, *sahajavyadhi* has some limitations but improves the quality of life from grassroots to average. Even though muscular dystrophy is an incurable disease, timely Ayurvedic management can effectively improve the quality of life of patients and slow down the further progression of the disease.



2.MUSCULAR DYSTROPHY - BROOKE SCALE FOR UPPER EXTREMITY AND VIGNOS SCALE FOR LOWER EXTREMITY

3.MUSCLE BULK

MUSCLE BULK	RT (At the time of admission)	LT (At the time of admission)	RT (6 months post-treatment)	LT (6 months post-treatment)
Arm (6 cm above elbow)_	26cm	27cm	26cm	27cm
Forearm (6 cm below elbow)	25cm	26cm	26 cm	26 cm
Thigh (10 cm above knee)	41cm	43cm	42 cm	43 cm
Calf region (10 cm below knee)	34cm	35cm	34 cm	34 cm



4.CPK value before and after treatment:

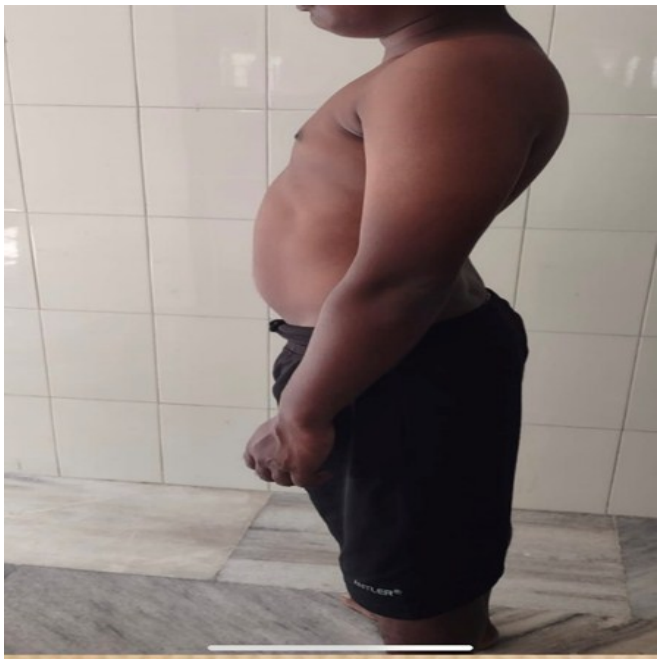


Image -1

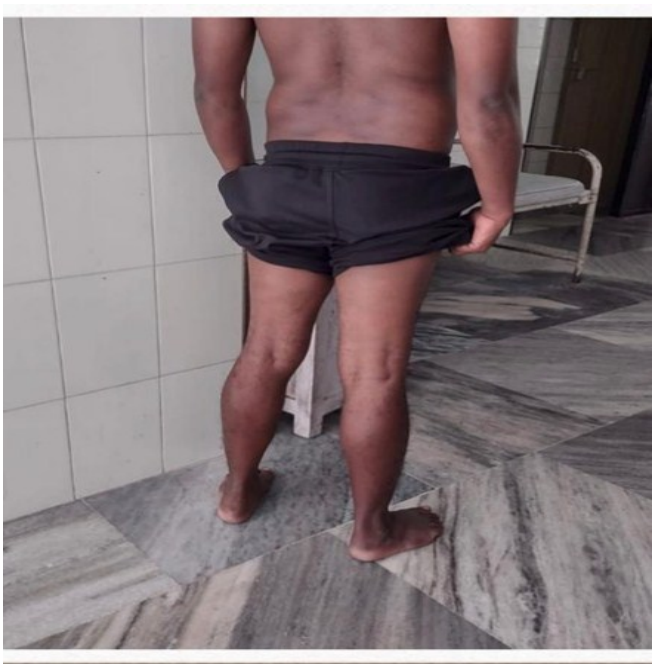
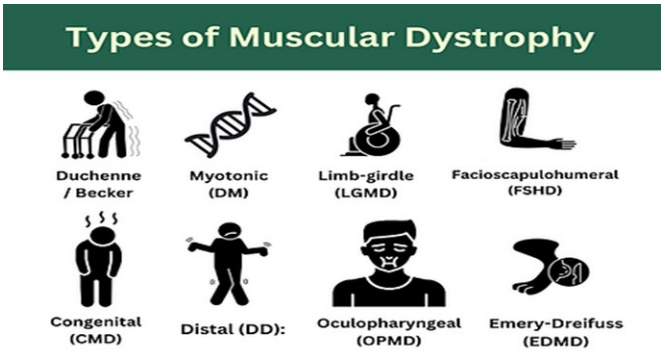


Image -2



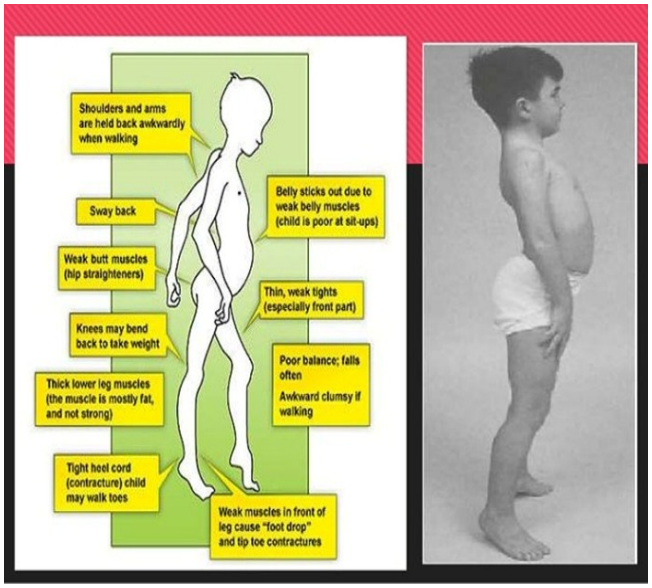
In Introduction: Image 3

LIMITATION OF THE STUDY:

As mentioned there is no complete cure for MD. The patient will only benefit from partial improvement in his symptoms and quality of life. The patient has to undergo repeated courses of treatment once in every year.

Conclusion

Ayurveda is a holistic science that controls the disease from its root cause and focuses more on improving the quality of life of an individual. As Muscular dystrophy is an incurable condition, maximum effort can be made to improve the quality of life of an individual. Treatments like *Deepana pachana*, *srotosodhana*, and *rasayana* all help in improving metabolism and reducing the pace of progression of the disease. This treatment protocol helped in reducing the weakness, improving mobility, breathing and muscle strength of the patient. Also, blood parameters like CPK which is suggestive of myopathies were considerably reduced post-treatment.



Clinical Features: Image 4

PATIENT CONSENT

Written consent regarding the publication of the study was taken from the patient.

PATIENT'S PERSPECTIVE

The patient was satisfied with the treatment and there is a subjective improvement in the quality of life of the patient.

References

1. Muscle Disorder - an overview | ScienceDirect Topics [Internet]. [cited 2024 May 15]. Available from: https://www.sciencedirect.com/topics/neuroscience/muscle-disorder
2. Muscular Dystrophy - an overview | ScienceDirect Topics [Internet]. [cited 2024 May 16] Available from: https://www.sciencedirect.com/topics/neuroscience/muscular-dystrophy

3. Dystrophin - an overview | ScienceDirect Topics [Internet]. [cited 2024 May 16]. Available from: https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/dystrophin

4. Perspectives on: SGP Symposium on Muscle in Health and Disease: Mechanisms of muscle weakness in muscular dystrophy - PMC [Internet]. [cited 2024 May 16]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2894554/

5. Creatine Kinase (CK): What It Is, Purpose & Procedure [Internet]. [cited 2024 May 16]. Available from: https://my.clevelandclinic.org/health/diagnostics/22692-creatine-kinase-ck

6. Thada PK, Bhandari J, Forshaw KC, Umapathi KK. Becker Muscular Dystrophy. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 May 16]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK556092/

7. Becker Muscular Dystrophy - an overview | ScienceDirect Topics [Internet]. [cited 2024 May 16]. Available from: https://www.sciencedirect.com/topics/nursing-and-health-professions/becker-muscular-dystrophy

8. Muscular dystrophy - Diagnosis & treatment - Mayo Clinic [Internet]. [cited 2024 May 16]. Available from: https://www.mayoclinic.org/diseases-conditions/muscular-dystrophy/diagnosis-treatment/drc-20375394

9. Mayo Clinic [Internet]. [cited 2024 May 16]. Muscular dystrophy-Muscular dystrophy - Diagnosis & treatment. Available from: https://www.mayoclinic.org/diseases-conditions/muscular-dystrophy/diagnosis-treatment/drc-20375394

10. Increased dystrophin production with golodirsen in patients with Duchenne muscular dystrophy - PMC [Internet]. [cited 2024 May 16]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7357297/

11. Prof.K.R Srikantamurthy. Susrutha Samhitha. In Varanasi: Chawkhamba Orientalia (15)

12. Bhagavan Dash, R K Sharma. Grahanidosa chikitsa. In: Charaka Samhita -Sutrasthana. Chowkhamba Sanskrit Series Office Varanasi

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