



RESEARCH ARTICLE

A CLINICAL PRE AND POST CASE STUDY OF DUCHENNE MUSCULAR DYSTROPHY MANAGEMENT WITH PANCHAKARMA

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ABSTRACT

Introduction: Duchenne Muscular Dystrophy (DMD) is inherited as an X-linked recessive disorder (Xp21) of muscle characterized by progressive muscle weakness, intellectual impairment, pseudo hypertrophy and wasting of cardiac, skeletal and smooth muscles. DMD has a commonly cited, yet estimated, incidence of 1 in 3500 male births¹ **Case presentation:** 13yr male patient complaining of loss of strength in lower limbs, difficulty in walking, pain and stiffness in lower limb. The patient's creatinine kinase was 4791Iu/L (Pre study). Since serum CPK is markedly elevated is considered a diagnostic marker of muscular dystrophies. **Management and outcome:** Patient was posted for Panchakarma treatments like sarvanga udvarthana, sarvanga pathrapinda sweda, sarvanga abhangya shatika shashalimamsapinda sweda, rajayapana basti treatments for 16 days. CPK levels were checked pre and post study. **Discussion:** Panchakarma treatments showed moderate improvement in the lower Limb muscles strength, reduction in pain, stiffness and improvement in quality of life. **Conclusion:** Panchakarma treatments were attempted to slow down the muscle weakness, improve muscle strength and range of movements, reduce pain, stiffness and also there was improvement seen in CPK levels pre and post treatment.

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INTRODUCTION

DMD is progressive muscle deterioration and weakness, in addition other organs of the body like the heart can also be affected and Nine types of MD are primarily seen in people, with the Duchenne Muscular Dystrophy (DMD) said to be the most prevalent. Which is caused by the mutation of the dystrophin genes located on the short arm of the X chromosome Xp21. Mutation can either be inherited or occurs spontaneously during germline transmission.

Ayurveda Understanding of DMD: DMD is considered as Adibala-pravrit vyadhi hereditary condition which highlights the role of genetic factors involvements by Defective Shukra and Shonita². This is associated with an imbalance of Vata dosha, specifically in the muscle tissue, the condition is characterized by obstruction in the tissue micro channel (srotorodha), leading to depletion of metabolic processes (dhatvagni) which leads to formation of toxins (ama), in turn contributes to the progressive wasting and necrosis of affected muscle fibers. There is no direct reference of this disease in classics but based on the dosha and dushya samurchana, samprathi can be assessed and accordingly treatment can be planned. As the treatises say nomenclature of a disease is not important³.

CASE STUDY

Chief Complaints: Loss of strength in both leg. Difficulty in getting up from sitting position since 7 yrs, Unable to walk without support. Changes in spine curvature.

History of present illness: A 14yr male patient came to OPD of Government District Ayush Wenlock Hospital Mangalore with chief complaint of Loss of strength in lower limbs, inability to walk. Patient was healthy 7 years ago, then gradually developed Loss of strength while climbing stairs, frequent falls while walking, Progressive loss of strength in lower limbs, Pain and stiffness, Changes in gait pattern. For this patient consulted to doctor and underwent genetic analysis, CPK, blood investigations & child was diagnosed as Muscular Dystrophy. His parents were explained about DMD disorder by the doctors, they prescribed few

medicines. Then they consulted to homoeopathy and naturopathy doctors for the treatment of child and got some relief. Now patient seeking further treatment approaches for better management through Panchakarma hence visited Government District Ayush Wenlock Hospital Mangalore.

Past history: No H/O DM, HTN, Jaundice. H/o pneumonia at age of 4 yrs.

Birth History: Child was delivered by LSCS after full term
Birth weight – 3.5 kg
No H/O neonatal disorders

Social history: Behavioural changes – child had emotional disturbances, he cries if anyone opposes him. Child does not mingle or play with other children easily and get irritated early

Diet History

Breakfast	dosa, iddali etc.
Lunch	chapathi, boiled rice etc.
Evening snacks	like bhelpuri, biscuits etc.
Dinner	chapathis + boiled rice etc

Immunization History: Immunization schedule followed properly except, at age of 4 ½ yrs booster dose of polio drops was not given.

Treatment History: At allopathic hospital (not given to child). T. prednisolone 20mg od ,T. rantac 150mg od b/f, T. shelcal 250mg od at night a/f Homoeopathy and naturopathy medicines (details of which not found)

GENERAL EXAMINATION

NAD

SYSTEMIC EXAMINATION

CNS	Conscious and oriented to time and place, normal intelligence
Cranial Nerves and Sensory-	no deficits
Involuntary movements:	Absent
RS	NVBS Heard
CVS	S1S2 Heard
P/A	Soft and Non tender, No organomegaly
Musculoskeletal System	
Inspection	Musculature: Calf muscle Pseudo hypertrophy +, mild atrophy of Gluteal and thigh muscles
	Mild Lumbar lordosis seen
	Waddling Gait seen
	No muscular twitching
Palpation	No pain or tenderness in Calf muscles
Muscle Power	3/5 in all limbs
Tone	Overall Hypotonia
Reflexes-	Superficial and Deep tendon reflexes - slightly diminished
Signs	Gower sign: Positive

INVESTIGATION: CBC with ESR, CPK

MATERIALS AND METHODS

Treatments/day	Day 1	Day2	Day3	Day4	Day5
Sarvangaudvartana with triphalachoorana and kolakulathachoorana	✓	✓	✓	✓	✓
Sarvangapatrapindasweda	✓	✓	✓	✓	✓

Treatments/day	Day6	Day7	Day8	Day9	Day10	Day11	Day12	Day13	Day14	Day15	Day16
Sarvanga abhyanga with mahanarayana taila	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sarvanga mamsa shashtika shali pinda sweda	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Treatments/day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Anuvasanabasti	A		A		A		A		A		A		A		A	A
Rajayapanabasti		N		N		N		N		N		N		N		

Anuvasana Basti: Ashwagandha ghritha 40ml + Mahanarayanataila 30ml

Rajayapana Basti

Rajayapana Basti Drvaya	Quantity
Honey	30ml
Saindava	6gm
Mahanarayanataila and ashwagandha ghrita(30ml+40ml)	70ml
Rajyapanakalka	20gm
Mamsa rasa	50ml
Rajyapanakwatha	250ml
Total	426ml

RESULTS

	Before treatment	After treatment
Inspection	Musculature: Calf muscle Pseudo hypertrophy +, mild atrophy of Gluteal and thigh muscles	Musculature: Calf muscle Pseudo hypertrophy +, mild atrophy of Gluteal and thigh muscles
	Mild Lumbar lordosis seen	Mild Lumbar lordosis seen
	Waddling Gait seen	Waddling Gait seen
	No muscular twitching	No muscular twitching
Palpation	No pain or tenderness in Calf muscles	No pain or tenderness in Calf muscles
Muscle Power	3/5 in all limbs	3/5 in all limbs
Calf muscle Tone	Hypotonia	Hypotonia
Reflexes-	Superficial and Deep tendon reflexes - slightly diminished	Superficial and Deep tendon reflexes - slightly diminished
Signs	Gower sign: Positive	Gower sign: Positive
CPK value	4791 IU/L	3650 IU/L

DISCUSSION

Rationality behind selection of panchakarma: DMD gradually weakens the muscles and eventually rendering them unable to walk or move accurately. As the condition is inherited there is no complete treatment found yet. vata is responsible for all kind of functions, motions and nutrition transportation to body so main culprit for the above said condition is vata and it has to be managed. Panchakarma is multidimensional effective speciality branch of ayurveda and prime modality of treatment in practice to overcome DMD. Panchakarma procedures aimed at controlling the onset of further progression of the disease and also provide nutrition to muscle, there by possibilities of restoring of dystrophin protein which helps in muscle growth and maximize the quality of life. In this present case it shows the ama lakshanas When ama is distributed in whole body, langhana and pachana is to be adopted⁴, so here sarvanga udvartana is planned first for achieving agni Deepana and in turn reduce stiffness and pain. Sarvanga patrapinda sewda was done, after that sarvanga abhyanga, sarvanga mamsa shashtikashali panda sweda, followed by rajayapanabasti which helps in further managing kupitavatadusti also facilitates for brihmana, rasayana effects⁵.

Probable Mode of Action Sarvanga Udhavarthana in DMD: Sarvanga udhavarthana was done with triphalachoorana and kolakuthachoorana. By rubbing powder on body in against the hair follicles which facilities underlying tissue to stretch in two directions, pressure transmitted to the deeper tissues, which leads to siramukhavivithatva⁵ which enhances venous circulation and lymphatic drainage. The nutrition is carried by the blood plasma to all cells and tissues. At the periphery nutrients are leaked out through the capillaries into the tissue spaces. Products which are not utilized or metabolic products of those tissues are entered to lymphatic and ultimately returned into blood stream again, if udvartana is done these products may come to blood approximately 6 times more than the normal. So the food materials may be reutilized for the nourishment of all tissues⁶. By this procedure metabolic waste products are carried by lymphatic to the blood and ultimately excreted through the Srotas so body becomes free of 'Mala' i.e toxins and feels devoid of heaviness. As a result, Twaka, Mamsa, Rakta, Asthi, etc. Are nourished properly, thereby dhatwagni also get nourishment causing a dhatusamyata⁶. Which benefits to vata shaman, sthirikaran of angas will takes place. Drugs used in udhavarthana shows additional benefits.

Sarvanga abhyanga Probable Mode of Action in DMD: After udvartana, abhyanga gives much good result in terms of sneha absorption and action. Abhyanga is a process in which body surface under goes manual pressure by various techniques and taila applied over the skin penetrates into tiryakadhamani, which cover the body like networks and their opening are attached to romakupa. Through these only virya of abhyanga etc, enter into the body after undergoing paka by bhrajaka pitta in skin and run through the systemic circulation via cutaneous circulation and lymphatic's. So during the act of abhyanga, a massage of the lymphatic could be performed by which lymph flow as well as the lymph movement is possible. Lymph is the extracellular fluid of the cell which contains amino acids, glucose, fat, hormone, enzyme, salt and lymphocytes. Lymph carries protein from the extracellular space to main stream of blood. Lymph having no direct pumping station like heart, moves through the body mainly by the movement of the muscles, exercise, massage, standing on the head gravity etc⁷. By looking the mode of action it is understood that abhyanga facilities for proper functioning of vata dosha, improve the blood circulation and returns back the protein lost naturally in the extracellular space to the main stream of blood by which body get nutrients also when we see the benefits of abhyanga and guna of sneha drugs are opposite to vata. Which act as balya, ayushakara, klesasahatva, abhigatasahatva, kaphavatanirodhana, balaprada, shak-ashrithavatahara.

Sarvangapatrapindasweda and sarvangashastikashalimamsapindasweda Probable Mode of Action in DMD: There are branches of arteries supplying to skin from networks of arterioles and capillaries that branch's to all the dermal structures and provide nourishment to the stratum germinativum of the epidermis. Swedana by its gunas capable of penetrating the microcirculatory channels i.e srotas and by snigdha guna it does sthambhagna whereas ushanaguna causes sitaghna, gauravghna, swedana, by heating effect increases metabolic activity and blood flow. Swedana provides dilation of the arterioles by laghu and sara gunawhich act on the dosha in the microcirculatory channels remove the stagnation making the leena dosha mobile and direct them to move towards kosta⁸, are expelled out from the body with the help of panchakarma. Which leads to srotoshuddhi and amapachana, by this it offers more oxygen, more endorphines to the affected area, which is beneficial for healing of the pathology as we are nourishing the body⁸. In various types of swedana karma different drugs are used like milk, rice, mamsa, drugs etc. swedana cause vasodilatation through which drugs absorbed into the body and does their action with the action of swedana.

Basti karma Probable Mode of Action in DMD: The basti in Ayurveda system cannot be confined as just rectal Transmucosal administration because normally niruha reaches illeo-cecal junction then returns back to be eliminated out⁹. Rectal administration provides rapid absorption due to the many drugs such as saindava which is having the property like snigdha, which liquefies the dosha and tikshanaguna breaks down the morbid dosha sanghata, sukshmaguna helps to reach the micro channels and na⁺ which play important role in absorption and madhu act like vehicle so veerya of bastidravya flow into the circulatory system which distributes to the apadamastakam¹⁰. Drugs administered high in the rectum are usually carried directly to the liver thus are subject to metabolism and drugs administered low in the rectum are delivered systemically by the inferior and middle rectal vein before passing through the liver. Yapanana and anuvasabasti retains inside for long time¹¹. Sneha get absorption and digestion by fat adhered to the colon is acted upon by the agni located above the colon, while it exudates to the exterior. Brimhanabasti showed the increased fatty acids in blood from 36mg to 85mg/ 100ml of blood and level of protein had been increased from 0.3 to 1 mg / 100ml of blood¹². Yapanabasti seen to reduce IgG and IgM in significant amount which clearly denotes the immune modulation of basti therapy¹³. Niruhabasti along with its therapeutic effects shows cleansing effects on the colon could dilute the toxin concentration in cecum and facilitates the removal of same¹⁴. niruha maybe thought to dilute the bacterial toxin concentration in large intestine. It reduces stagnation and subsequent bacterial proliferation in large intestine and maintains harmony of the intestinal flora in promoting optimal colon health¹⁴. The therapeutic effect is improved muscle tone, which facilitates peristaltic action and enhances the absorption of nutrients from cecum and ascending colon while minimizing the absorption of toxic waste material moreover it may enhance the immune tissue residing there to secrete antibody and cytokines etc. to maintain the innate as well as overall immunity¹⁴. By analysing the mode of action it is understood that basti has its effect on two important factors viz vata and agni, both are responsible for formation and nutrition of dhatu so by controlling vata, all dhatu are able to perform their normal function.

CONCLUSION

DMD there is no precise treatment in medical science so with the help of Ayurveda with special reference to panchakarma procedures revealed protective influence. Which can slow down the progression of disease and help in maximizing the quality of life. The treatment designed to eliminate toxins from body and restore the equilibrium status of the dosha's and agni there by rejuvenate the body cells, , which improve the blood circulation and nutrition supplementation to body and mind that aids in the development of muscle mass, strength, boosting the immune system these minimize the risk of developing other medical condition and improve the vital body functions. These are effective treatments for the DMD and since progression is fast and fatal so should be monitored throughout their lives. Hence this procedure should be adopted over a period of time to maintain quality of life and hinder the disease progression.

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