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## TITLE

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QUADRIPARESIS DUE TO METACHROMATIC LEUKODYSTROPHY (MLD), A CASE  
STUDY “**

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**EFFECT OF AYURVEDA IN PALLIATIVE MANAGEMENT OF PROGRESSIVE QUADRIPARESIS DUE TO METACHROMATIC LEUKODYSTROPHY (MLD), A CASE STUDY**

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**ABSTRACT:**

*Metachromatic Leukodystrophy (MLD) also referred as a lysosomal storage disorder is inherited in an autosomal recessive manner, and is most commonly caused by a mutation in a gene called arylsulfatase A (ASA), also called sulfatide sulfatase. It is estimated to occur in 1 in 40,000 to 1 in 160,000 individuals worldwide. The disease produces symptoms between the ages of 1 and 2 and its late infantile form is most common. Juvenile form generally becomes apparent between the ages of 4 and 12, and the adult form occurs after age 14. The earlier the onset, the more rapid the progression of the disease finally leading to death. Till now no proper treatment of MLD has been discovered only trials are going in the form of bone marrow and stem cell transplant therapy. This is the case of a twenty five years old male with complain of difficulty in walking, memory and behavioral disturbances, urinary disturbances, weakness of all limbs, speech disturbances and involuntary movements of both hands.*

*Diagnostic and assessment criteria have shown that the patient is probably suffering with Adult onset MLD having symptoms of progressive quadriplegia, urinary, speech and memory disturbances. The treatment plan was devised in order to improve the overall condition of the patient. Also, the symptoms relate it to the Sarvanga Vata described in Ayurveda and thus the treatment was planned on the line of Vatavyadhi Chikitsa. The total duration of treatment was 3 months in which mainly the Vata Shamaka Panchakarma therapy along with oral drug was given. Treatment plan included Sarvanga Abhyanga with Bala Ashwagandha Taila, Sarvanga Mridu Nadi Swedana, Shiro-Vasthi and oral use of medhya rasayan.. The 3 months of treatment had significant improvement in the condition of the patient.*

**Key Words:** ASA, Bala Ashwagandha Taila, MLD, Medhya Rasayan, Nadi swed.

## INTRODUCTION

### CORRESPONDENT:

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Metachromatic Leukodystrophy (MLD) is inherited in an autosomal recessive manner, and is most commonly caused by a mutation in a gene called arylsulfatase A (ASA), also called sulfatide sulfatase. The protein produced by ASA is present in the lysosome, a compartment of the cell that specializes in general “clean-up” of the cell. You may hear MLD referred to as a lysosomal storage disorder, since ASA is a lysosomal enzyme. ASA is required for the breakdown of sulfatides, also called glycolipid- cerebroside sulfates, which are fats present in myelin. When ASA is deficient, the sulfatides build up in the myelin to high levels, disrupting the myelin structure and causing demyelination to occur in both the central nervous system and in the peripheral nervous system<sup>1</sup>.

The incidence of metachromatic leukodystrophy is estimated to occur in 1 in

40,000 to 1 in 160,000 individuals worldwide<sup>2</sup>. There are three forms of MLD, defined by the age of onset of the disease. The late infantile form of MLD is the most common, and produces symptoms between the ages of 1 and 2. The juvenile form generally becomes apparent between the ages of 4 and 12, and the adult form occurs after age 14. As with all the leukodystrophies, the symptoms can vary widely, although in all cases there is a progressive loss of physical and intellectual function over a relatively extended period of time. In general, the earlier the onset, the more rapid the progression of the disease finally leading to death. Till now no proper treatment of MLD has been discovered only trials are going in the form of bone marrow and stem cell transplant therapy,<sup>3</sup> which is not possible in all the cases. So through Ayurveda we can at least try to give a better life to the patient by decreasing the progression of the diseases.

In Ayurveda it can be described as *Shiromarmagat vata vyadhi* which may manifest as many conditions such as *Sarvanga vata*, *Ardhanga Vata*, etc. It is stated that the vitiated *Vata Dosha* destroys homogeneity of the body producing symptoms like restriction of movements,

pain and difficulty in speaking, urinary disturbances, memory loss, etc<sup>4</sup>.

### CASE STUDY

This is the case of a twenty five years old male with chief presenting complaints as-

- Difficulty in walking in the form of dragging of left lower limb i.e. gait disturbances since 8 years.
- Memory and behavioral disturbances since 4 years.
- Urinary disturbances i.e. urgency and incontinence since 3 years.
- Weakness of all limbs since 3 years.
- Total inability to walk i.e. bed ridden since 8 months.
- Speech disturbances.
- Involuntary movements of both hands.

**Past History:** No similar complaints in the past.

**Developmental History:** Full term LSCS delivery with normal cry after birth. Normal developmental history.

**Previous Treatment History:** L5- S1 Laminectomy done 4 years back.

**Physical Examination Findings-**The general condition of patient was conscious

and bed ridden with normal cardio vascular and respiratory system functions.[Table 1]- Examination findings

**MRI(T2)findings-**Bilateral Periventricular Hyper intensities.

**Diagnosis –** Progressive Quadriparesis due to probable MLD.

**Treatment Plan:** The total duration of treatment was 3 months in which mainly the *Vata Shamaka Panchakarma* therapy along with oral drug was given.

A) Treatment in 1<sup>st</sup> sitting (for 25 days) - :For first 15 days –

1. *Sarvanga Abhyanga*

– *Bala Ashwagandha Taila*<sup>5</sup>  
*Sarvanga Mridu Nadi Swedana* –  
*Dashmoola Kwatha*

2. *Shiro-Vasti- Dhanwantara Taila*<sup>6</sup> +  
*Brahmi Taila* : For next 7 days – *Matra Vasti* with *Maha Masha Taila* + *Bala Ashwagandha Taila* in the dose of 30 ml. each.

B) Oral medicine – Given to patient between 2 *Panchakarma* therapy sittings for a period of 1 month  
*Syrup Shankpushpi*- 20 ml. BD

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*Ashwagandhachurna* - 3 gm. BID  
with milk  
*Brahmi Vati* - 1 BID

Treatment in 2<sup>nd</sup> sitting (for 25 days)–  
The treatment which was given during  
1<sup>st</sup> sitting was repeated.

**RESULT**

**BT-AT Comparison** –Such 2 sittings of 25 days each are given to the patient at interval of 1 month. After 3 months of treatment the improvement in the signs and symptoms of the patient is shown in table no.2.

[Table 2]– **BT-AT comparison**

**DISCUSSION**

The diagnostic and assessment criteria have shown that the patient is probably suffering with Adult onset MLD having symptoms of progressive quadriparesis, urinary, speech and memory disturbances. The treatment plan was devised in order to improve the overall condition of the patient. Also, the symptoms relate it to the *Sarvanga Vata* caused due to *Shiro marmagata vata vyadhi* described in Ayurveda and thus the treatment was planned on the line of *Vatavyadhi Chikitsa*. The 3 months of treatment had significant improvement in the condition of the patient.

**The probable mode of action of the Treatment Procedures:**

The *Sarvanga Abhyanga* and *Nadi Sweda* provide nourishment; pacify *Vata* and produce softness as *Mardavajanan*

(production of softness) is the property of both *Abhyanga* and *Swedana*. *Bala Ashwagandha Taila* contains mostly *Vata* pacifying and *Balya* (nourishing) ingredients, thus, can be attributed to pacify *Vata* and provide nourishment. In addition, the *Dashmoola Kwatha Nadi Swedana* pacifies *Vata*, as the main action of *Dashmoola* being *Vatahara* it also acts to reduce spasticity (*Stambha*), Hyper tonicity (*Gaurava*), and produces sweat thus softening the skin. The *Shirovasti*<sup>7</sup> which is most suited procedure for *Shiro marma gata vata vyadhi* followed by head massage improves the blood circulation thus soothes the mind and stabilizes the memory, speech, balancing and urinary incontinence of the patient. The *Dhanwantara Taila* and *Brahmi Taila* used in this process provides

nourishment to the brain and improves mental abilities by their *vata hara* and *medhya* properties. “*Basti Vataharanam*”<sup>8</sup>, is known to be the best to pacify *Vata*. This series of *Basti* given in the form of *Matra Basti* alleviates *Vata*, purifies the body by removing toxins carrying out *Mridu-shodhana* and also the contents of the *Basti* provide nourishment to the patient. The *Mahamasha Tailam* (used in *Basti*) is said to destroy all *Vata* Disorders like *Pakshaghata*, *Ardita*, *Badhirya*, *Hanugraha*, *Karnanada*, *Shirah-shoola*, etc<sup>9</sup>. while the *Bala Ashwagandha Taila* ( used in *Basti* ) is *vata hara* and *balya*.

As there is nervous damage present thus, the drugs used are specifically nourishing and

rejuvenating like *Rasayanas* described in *Ayurveda*. The *Medhya Rasayana* such as *Ashwagandha* (*Withaniasomnifera*), *Shankhapushpi* (*Centellaasiatica*), *Brahmi* (*Bacopamonnieri*) etc have nootropic effects (Stimulation of Mental activities and increasing intellect) as they are nervine tonics<sup>10</sup>.

Thus, by the combined actions of the different therapies and drugs, there is overall relief in the symptoms of the patient as per the results shown. All this progress attributes to the *Vata Shamaka* and *Brihmana* properties of drugs used in the treatment.

### CONCLUSION

As observed from the results, in first month the effects of the treatment were a success, though minimal which results in improve tonicity of the muscle with some improvement in mental functions and urinary dysfunctions. Whereas when the treatment was further extended there was significant improvement in almost all the parameters taken. The time interval for sitting and walking with and without support increased and the spasticity and hyper tonicity decreased significantly, the muscle power increased to grade 4 in both right

upper and lower limb and a significant improvement was noted in mental functions and urinary functions. Hence, the condition brought about by MLD though not be treated completely but can be improved to a significant extent especially in case of progressive quadriparesis and urgency as this one. And with the continuation of the treatment we hope for much better results coming forth.



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**[Table 1] - Examination findings**

| Motor examination     | Right limb      |                              | Left limb       |                              |
|-----------------------|-----------------|------------------------------|-----------------|------------------------------|
|                       | Upper           | Lower                        | Upper           | Lower                        |
| 1. Muscle bulk        | Normal          | Normal                       | Normal          | Normal                       |
| 2. Muscle power       | Grade 3         | Grade 2                      | Grade 3         | Grade 2                      |
| 3. Muscle tone        | Less Hypertonic | Hypertonic<br>Spasticity +nt | Less Hypertonic | Hypertonic<br>Spasticity +nt |
| 4. Deep tendon reflex |                 |                              |                 |                              |
| Biceps                | 3+              | 3+                           | 3+              | 3+                           |
| Triceps               | 2+              | 2+                           | 2+              | 2+                           |
| Knee                  | 3+              | 3+                           | 3+              | 3+                           |
| Ankle                 | N               | N                            | N               | N                            |
| Plantar               |                 | Increased                    |                 | Increased                    |
| Sensory examination   |                 |                              |                 |                              |
| Touch                 | Normal          |                              | Normal          |                              |
| Pain                  | Normal          |                              | Normal          |                              |
| Temperature           | Normal          |                              | Normal          |                              |
| Vibration             | Impaired        |                              | Impaired        |                              |
| Tremors               | Present         |                              | Present         |                              |
| Co-ordination test    |                 |                              |                 |                              |
| Finger nose test      | Normal          |                              |                 |                              |
| Gait                  | Spastic         |                              |                 |                              |
| Involuntary movements | Present         |                              |                 |                              |

**[Table 2] – BT-AT comparison**

| Before Treatment                |            | After 1 <sup>st</sup> sitting   |                               | After 2 <sup>nd</sup> sitting |  |
|---------------------------------|------------|---|-------------------------------|-------------------------------|--|
| Bed Ridden                      |            | Able to sit with support  |                               | Able to sit without support   |  |
| Unable to Stand Without Support |            | Able to stand momentarily without support                             |                               | Able to stand without support |  |
| Unable to walk With Support     |            | Able to walk 100 meters with support                                  |                               | Able to walk without support  |  |
| CNS Examination                 |            | Before Treatment  | After 1 <sup>st</sup> sitting | After 2 <sup>nd</sup> sitting |  |
| Nutrition of The Muscle         | Upper Limb | Normal  | Normal                        | Normal                        |  |
|                                 | Lower Limb | Normal  | Normal                        | Normal                        |  |
| Muscle Tone                     | Upper Limb | Hyper-tonicity  | Decreased                     | Decreased                     |  |
|                                 | Lower Limb | Hyper-tonicity  | Decreased                     | Decreased                     |  |
| Plantar Reflex                  | Right      | Extensor  | Slightly Improved             | Improved                      |  |
|                                 | Left       | Extensor  | Slightly Improved             | Improved                      |  |
| Biceps Jerk                     | Right      | +++   | +++                           | ++                            |  |
|                                 | Left       | +++   | +++                           | ++                            |  |
| Knee Jerk                       | Right      | +++   | +++                           | ++                            |  |
|                                 | Left       | +++   | +++                           | ++                            |  |
| Gait                            | Spastic    | Spastic   | Slightly Improved             | 40% Improved                  |  |
| Muscle Power                    | Upper Limb | Grade- 3  | Grade- 4                      | Grade- 4                      |  |
|                                 | Lower Limb | Grade- 2  | Grade- 3                      | Grade- 4                      |  |
| Mental Status                   |            |   |                               |                               |  |
| Speech                          |            | Indistinct with low pitch   | Mild improvement              | Moderately Improved           |  |
| Memory                          |            | Short term<br>New learning Abilities<br>impaired<br>Attention Deficit | Mild improvement              | Significant improvement       |  |
| Urinary Disturbances            |            | Urgency and Incontinence  | Improved                      | Totally Improved              |  |

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