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Myositis: An Autoimmune Disease

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ABSTRACT

It is the name for a group of rare conditions that can cause muscles to become weak, tired ad painful. The meaning of myositis is inflammation of muscles. It affects all age group of people. It affects the muscles that connect to your bones. There's no curative treatment for myositis, but in most cases, but with the life style modification and treatment can strengthen weak muscles as supportive.

Keywords: Myositis; Muscles.

INTRODUCTION

Myositis attacks immune system and muscles. It affects the muscles that connect to your bones (skeletal muscles). Different forms of myositis affect the various muscles of the body. It has various types which makes muscles weak a pain.

Myositis:

It is a disease that attacks immune system and muscles and leads chronic inflammation or swelling that comes and goes over a long time. Eventually, this inflammation makes the muscles feel increasingly weak and cause muscle pain.[1]

Incidence: Myositis affects all age group including children.

Types of myositis

The types of myositis are mentioned below:

- Dermatomyositis
- Inclusion body myositis
- Juvenile myositis
- Polymyositis
- Toxic myositis

Dermatomyositis: It is the easiest form of myositis to diagnose due to the purple red rashes in the heliotrope flower shape. The rash develops on the eyelids, face, chest, neck, and back. It also develops over joints such as knuckles, elbows, knees and toes. Muscle weakness normally follows.[1]

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Causes & Risk factors: The cause of dermatomyositis remains unknown, but experts believe following factors plays a vital role:

Genetic Factors: People with particular human leukocyte antigen are at a prone to get this condition.

Immune system: People with dermatomyositis show an abnormal immune reaction, where by the body's immune system attacks small blood vessels, causing inflammatory changes in the:

- Muscles
- Skin
- Blood vessels

Environmental Factors: Exposure to ultra violet ray sare one of the main risk factors and certain viruses could trigger the condition. These include:

- Parvovirus
- Enterovirus
- Coxsackie B virus
- Echovirus
- HIV[2]

Symptoms of DM include:

- Scaly, dry, or rough skin
- Red colour or purple rashes on sun exposed areas which causes painful or itchy sensation
- Swelling on upper eyelids
- Gottron's papules
- Difficulty inrising from a seated position
- Fatigue, weakness in the neck, hip, back, and shoulder muscles
- Difficulty swallowing
- Hoarseness in the voice
- Hardened lumps are present under the skin
- Muscle pain
- Joint inflammation
- Nail bed abnormalities
- Weight loss
- Irregular heartbeat
- Gastrointestinal ulcers

Diagnosis:

- MRI to look for abnormal muscles.
- Electromyography to find electrical impulses which controls the muscles.
- Blood analysis to find enzymes and autoantibodies.
- Muscle and skin biopsy.

Treatment:

- Corticosteroid medications are the preferred method of treatment in most cases. To lower the response of immune system, which reduces the inflammation causing antibodies.
- In this condition the body is producing antibodies to target skin and muscles. Intravenous immunoglobulin (IVIG) uses healthy antibodies to block these antibodies. IVIG consists of a mixture of antibodies that have been collected from thousands of healthy people who have donated their blood. These antibodies are given to you through an IV.
- Physical therapy that improves and preserves muscle strength.
- Antimalarial medication, hydroxy chloroquine, for a persistent autoimmune rash.

Complications: Some common complications are:

- Skin ulcers
- Gastric ulcers
- Difficulty breathing
- Lung Infections
- Problems Swallowing
- Malnutrition
- Weight loss
- Dermatomyositis can also be associated with conditions such as:
  - Raynaud's phenomenon
  - Myocarditis
  - Interstitial lung disease
  - Increased risk of developing cancers[3]

Inclusion body myositis: is the only myositis which occurs more commonly in males than in females. Most people who develop this condition are above the age of 50. IBM begins with muscle weakness in the wrists and fingers and also in the thigh muscles. The muscle weakness is more prominent in smaller muscles and is asymmetrical. IBM is believed to be genetic.[4]

Symptoms of Inclusion body myositis:

- Difficulty walking
- People may loss of balance while walking
- Frequent falls
- Difficulty to rise from a seated position
- Weakened grip in hand and loss of finger dexterity
- Difficulty swallowing
- Muscle weakness
- Muscle pain
- Diminished deep tendon reflexes
- Juvenile myositis[5]

Diagnosis:

- *Physical examination:* A healthcare professional will check your muscles and look for signs of weakness. They will also examine your muscle function as you do certain tasks, like walking.
- *Muscle biopsy:* A muscle biopsy is the common test for diagnosing inclusion body myositis.
- *Electromyogram:* This test checks the electrical activity of your muscles at rest and during contraction.
- *Nerve conduction test:* A nerve conduction to find how fast a nerve impulse can travel through your muscle. It can help rule out other nerve disorders.
- *Blood tests:* To be done to find the elevated levels of creatine kinase. This enzyme leaks out of muscle when it's damaged.
- *Muscle MRI:* A muscle MRI is an imaging test. It can help a doctor check the structure of your muscles.[6]

Treatment:

- There is no certain treatment for inclusion body myositis.
- Physical therapy to strengthen muscle.
- Occupational therapy can help make daily activities easier and help avoid falling injuries.
- Speech language therapy can help manage swallowing problems.

Surgical treatment:

- If swallowing difficulties are severe, patient might need surgery. This may include myotomy or cricopharyngeal dilation.
- Myotomy is a incision over the muscles of the cardia, which helps food and liquids to enter the stomach.
- In a cricopharyngeal dilation, a surgeon stretches the muscle at the top of the esophagus to allow food to pass easily.
- In severe cases, gastrostomy (feeding tube) might be needed.[7]

Complications:

- Swallowing difficulties (dysphagia) that may lead to choking.
- Disrupted breathing from the weakened diaphragm.
- Injuries from falls.
- Pressure sores, muscle atrophy due to poor mobility.[8]

Juvenile myositis: (JM) occurs in children under 18. It affects 3,000 to 5,000 American children. Girls are twice as likely to develop JM than boys. Similar to the other forms of myositis, JM is characterized by muscle weakness and skin rashes.[9]

Symptoms of Juvenile myositis:

- Visible, reddish purple rashes over the eyelids or joints
- Fatigue
- Irritability sensation and mood changes
- Stomach aches
- Difficulty in climbing upstairs, and rising up from a seated position
- Difficulty to reach over head while shampooing or combing hair
- Trouble in lifting the head
- Inflammation around the fingernails
- Trouble swallowing
- Hard lumps of calcium under the skin
- Muscle weakness
- Muscle and joint pain
- Hoarse sounding voice
- Gottron's papules

- Fever
- Vasculitis
- Lipodystrophy
- Calcinosis (hard, often painful lumps or sheets of calcium that form under the skin's surface, especially in juvenile dermatomyositis).[10]

Diagnosis

Blood tests: Blood tests for certain muscle enzymes such as creatine kinase (CK or CPK), aldolase, lactate dehydrogenase (LDH), Alanine aminotransferase (ALT) and aspartate aminotransferase (AST).

Magnetic resonance imaging (MRI): Helps to detect inflammation levels in the muscle.

Electromyogram: It may be done to look for any nerve or muscle damage. Another important modality is an FDG, PET, CT, which uses nuclear imagining techniques.

Muscle and skin biopsies: It is the best way to diagnose all types of myositis disease.[11]

Treatment:

There are certain medications for treating JM include:

Corticosteroids: It can be given orally, by injection, or intravenously (directly into a vein) to slow down the autoimmune response. Dosage and duration of treatment depend on the severity of symptoms.

Immunosuppressants: Immusuppresssant medica -tions, such as methotrexate, azathioprine, and cyclosporine, work to quiet the immune system. They may be given alone or with hydroxychloroquine (an anti-malaria drug) and mycophenolate mofetil.

Intravenous immune globulin (IVIG): IVIG therapy can slow down the body's autoimmune response and block harmful antibodies responsible for the inflammation that attacks the muscles and skin.

Other medications: Another medicine used to treat JM include an anti-TNF biologic drug, rituximab.

Physical Therapy

Physical therapy and physical activity are important for children with JM. They can help a child to maintain and increase their muscle strength and flexibility.[12]

Education

- Educate parents to use sunscreen to avoid irritation.
- Advice parents to talk to dietician to solve chewing and swallowing problems.[13]

Polymyositis

Polymyositis (PM) begins with muscle weakness around the trunk of the body and then expands from there. People with polymyositis are often found to have additional autoimmune diseases.

Symptoms include:

- Muscle weakness
- Muscle pain
- Difficulty swallowing
- Falling
- Difficulty to rise from a seated position
- Fatigue
- Chronic dry cough
- Hardening of the skin on the hands
- Difficulty breathing
- Fever
- Weight loss
- Hoarse voice[14]

Diagnosis

Blood tests. A blood test to know the increased amount of muscle enzymes to find muscle damage.

Electromyography. This test involves inserting a thin needle electrode to the muscle to find changes in the pattern of electrical activity in a muscle.

Magnetic resonance imaging (MRI). MRI can assess inflammation over a large area of muscle.

Muscle biopsy: Analysis may reveal abnormalities, such as inflammation, damage, certain proteins or enzyme deficiencies.

Treatment

Although there's no cure for polymyositis, treatment can improve your muscle strength and function.

Corticosteroids. It can be very effective in controlling the symptoms. But longer usage of these drugs may cause serious side effects, So, gradually taper the dose of medication down to lower levels.[15]

Therapy: There are certain treatment which includes:

Physical therapy: A therapist will help to maintain

and improve the strength and flexibility and advise an appropriate level of activity.

Speech therapy: It may help the person who have weakened muscles in swallowing area.

Dietetic assessment: Dietitian will teach how to prepare easy-to-eat, the nutritious foods for who have chewing and swallowing problem present.

Complications of Polymyositis:

Difficulty in swallowing: This could happen if the muscles in your oesophagus are affected. It can lead to weight loss and malnutrition.

Aspiration pneumonia: When you can't swallow well, you're more likely to breathe food or liquid (including saliva) into your lungs. This can cause pneumonia.

Breathing problems: If your chest muscles are affected, you could have shortness of breath, or, at worst, respiratory failure.[16]

Toxic myositis: Toxic myositis is caused by some prescribed medications and illicit drugs. Cholesterol lowering medications such as statins may be among the most common drugs to cause this condition.[17]

Symptoms of toxic myositis: Symptoms are similar to those of other types of myositis. People may have improvement after stopping of medication.

- Difficulty to rise up from sitting position.
- Torso or "core" weakness.
- Difficulty swallowing (dysphagia).
- Muscle pain.

Diagnostic Tests:

- History collection
- Physical examination
- Blood test to find elevated enzymes in the blood
- Electromyography (EMG)
- Nerve conduction tests shall be performed

MRI of the Muscles: MRI, or magnetic resonance imaging, is a medical test that uses biological magnets and a computer to create pictures of the inside of the body. These pictures then aid doctors and specialist in determining injuries or diseases. The MRI is sometimes compared to the CT (Computed Tomography), which uses similar technology to create cross-sectional images of the body.[18]

Treatment: People who experience of this condition can feel improvement once they stop the medication which causing the toxicity.

Dietary management:

A healthy diet can go a long way toward improving over all health. While eating This diet special consideration to be taken. It includes the following:

- Processed and fast foods, including those with high fructose corn syrup, artificial ingredients, preservatives, fresh fruits and vegetables and pesticides to be avoided.
- The number of foods made with white flour and sugar, and most packaged foods to be reduced and whole grains shall be included.
- In take of saturated fat to be limited by eating less animal fats.
- Shall Use extra virgin olive and expellerpressed canola, sunflower, and safflower oil and nuts shall be taken.
- Omega-3 fatty acids diet to be included.
- Vegetable protein diet to be included than choosing of animal proteins.
- Beverages and coffee to be avoided.

Dietary precautions for those taking corticosteroids. People who consume corticosteroids for longer periods of time, may face certain complications for what they eat too.

- Prednisone increases appetite. To reduce weight gain, high calorie foods to be avoided and exercise will help to maintain body weight.
- To reduce the risks of high blood pressure and fluid retention, limit salt intake to be less than 1,500 mg per day. Processed or canned foods to be avoided.
- If patient is taking medication for high blood pressure, may need to increase in take of foods high in potassium, such as bananas, apricots, baked potatoes, and tomatoes.
- Prednisone can also irritate the stomach, so it is important to take it with food, not on an empty stomach.
- Diabetes is also a risk when taking steroids. To control blood glucose levels with in the normal range, high carbohydrates foods like sugar to be avoided.

Dietary supplements: The recommendations are

mentioned below:

- *Calcium* is a concern for those who take corticosteroids. Should eat foods rich in calcium as nuts milk and milk products. Calcium supplements are also recommended to minimize bone loss and osteoporosis.
- *Vitamin D* is a hormone produced in the skin in response to sunlight. It is important in calcium absorption and many other processes.
- *Folic cid* (also called folate) is a B vitamin that is abundant in leafy green vegetables, such as spinach, kale, broccoli, and other sources.
- *Omega-3* fatty acids, which are anti-inflammatory, and omega-6 fatty acids, which are pro-inflammatory, should be in balance in the body. canola oil, walnuts, and enriched eggs.[19]

CONCLUSION

Myositis is an inflammation of muscles which attacks immune system and muscles. Depending on which type of myositis it is a hard time to move or use affected muscles. There's no curative treatment for myositis, but in most cases, but with the life style modification and treatment can strengthen weak muscles as supportive.

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