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GAVIN PUBLISHERS

Chronic Pain and Management Journal

Guerrera MJ. Chron Pain Manag 2: 115.
DOI: 10.29011/2576-957X/100015

Review Article

Dermatomyositis: Expanding the Treatment to Physical Medicine and Other Complementary and Alternative Medical Therapies

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Citation: Guerrera MJ (2019) Expanding the Treatment to Physical Medicine and Other Complementary and Alternative Medical Therapies. Chron Pain Manag 2: 115. DOI: 10.29011/2576-957X/100015

Received Date: 14 June, 2019; **Accepted Date:** 05 July, 2019; **Published Date:** 12 July, 2019

Abstract

Dermatomyositis (DM) is a rare disease which affects the skin and muscular system. The criteria for the identification of this disease was established in 1975 by Anthony Bohan and James Peter in the New England Journal of Medicine [1]. It is usually diagnosed by the signs evident on the skin and the weakening effects it has on muscle. A definitive diagnosis for this disease is still elusive as others possessing similar symptoms can complicate the process. Agreement centres around the fact that an autoimmune element has been identified and drug therapy has been successful in many cases with treating the symptoms associated with DM. Sometimes the disease seems to abate completely, which is not clearly understood so presently this disease is described as having no known cure. One of the suggested treatments to augment drug therapy is physical or occupational therapy. Targeted at muscle specifically, the goal is to increase circulation and prevent further compromise of muscle cells from the inflammation seemingly caused by the autoimmune reactions taking place. How effective is this physical treatment and would additional Complementary and Alternative Medicine techniques (CAM's) be beneficial in producing further reductions in symptomatology? This paper will explore this question after reviewing the current protocols for diagnosis, drug and physical therapy.

Keywords: Anti-inflammatory; Autoimmune diseases; Inflammatory cytokines; Integrative healthcare; Muscle weakness; Skin rash; Spinal manipulation

Diagnosis

Individuals showing signs of DM, specifically skin rash and symptoms which include muscle weakness undergo; blood work to determine muscle enzyme levels. Elevated Creatine Kinase (CK) and aldolase are reflective of muscle damage [2]. Electromyography (EMG) and chest x-rays are performed. EMG to evaluate electrical activity within the muscle. The chest x-ray screens for any related lung involvement as complications of DM can include compromise in this organ [1]. Magnetic Resonance Imaging (MRI) is performed to look for areas of inflammation in cross sectional views of muscle. Skin or Muscle biopsy is performed. Biopsies of skin are used to rule out other skin diseases but muscle biopsy is diagnostic [3,4] (Figure 1).

Figure 1: Dermatomyositis: Signs and Symptoms.

Current Drug Protocol

Immunosuppressant, anti-inflammatory therapy is the initial treatment most often given in cases of DM. Prednisone administered in high doses initially 5-60 mg orally/day until a reduction in symptoms is observed [5]. Methotrexate with its ability to target rapidly growing cells is often administered after prednisone but toxic side effects to the liver can occur [6,7]. An alternative drug also possessing immunosuppressive actions is Mycophenolate mofetil (CellCept). This drug works by inhibiting lymphocytes and is well tolerated [8]. When this standard, initial treatment fails to reduce the symptoms associated with DM the next link in the protocol commonly chosen is Intravenous Immune globulin therapy (IVIg) [9]. This therapy is a mixture of variable amounts of proteins (albumin, IgG, IgM, IgA and IgE), salt, sugar, solvents and detergents. Though the mechanism of action of IVIg in treating autoimmune disease is unclear, it is well tolerated and considered safe [10]. Dysphagia, a secondary complication of DM has been shown to improve after IVIg treatments [11].

Physical Therapy Protocol

Dermatomyositis affects muscles by way of inflammation, weakness and decreased endurance. Proximal muscle groups are the primary regions initially involved. Exercise is beneficial in limiting these manifestations of the disease [12]. A physically active lifestyle is necessary in the maintenance of health. Muscle physiology involving the contraction and relaxation of muscle fibres promotes the influx of circulation, and the release of waste products and toxins.

When circulation is interrupted or compromised by a disease such as DM the homeostasis of the muscle and the areas and regions of the body it serves are compromised. Physical therapy techniques such as massage and passive range of motion mobilizations cause direct circulation to the muscles and promote the flushing of inflammatory fluid out of the area treated. Beyond a passive approach to exercise, studies have shown improved performance and increased aerobic capacity after endurance training in patients with polymyositis and DM [13].

If exercise is beneficial as an anti-inflammatory process, why not begin to prescribe it at the earliest stages of the disease and augment it with other modalities of physical medicine such as ultrasound and muscle stimulation therapies. Earlier beliefs held that a newly diagnosed case of DM especially in acute form should not be prescribed an exercise or physical therapy regiment for the fear of exacerbating the symptoms and injury to muscle tissue. [13,14] (Figure 2).

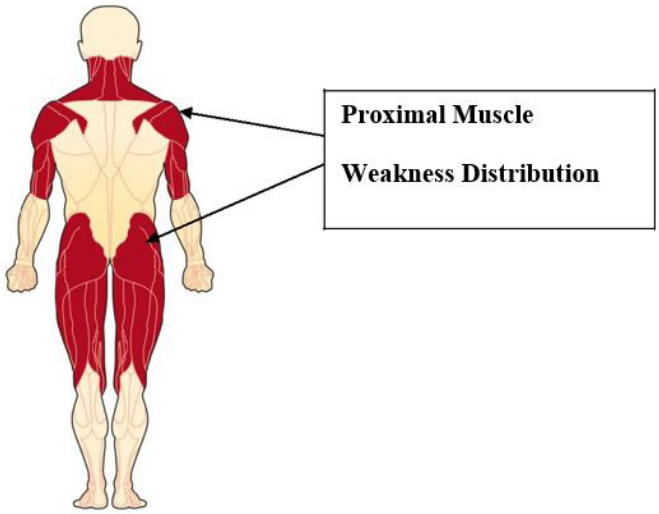

Figure 2: Dermatomyositis which affects the physiology of muscle.

Muscle Physiology

As has been stated, Dermatomyositis is a disease which affects the physiology of muscle. Reviewing the basics, muscle tissue contracts with stimulation from the nervous system. A skeletal muscle fibre is innervated by a nerve via a gap called the neuromuscular junction [15]. This microscopic gap can be interrupted by the inflammatory process. Re-establishing the message across this junction is vital and can be aided by drugs which can inhibit inflammation and stimulate circulation. Exercise brings more circulation to a working muscle and in doing so pushes out accumulated fluid. Normal physiology of muscle is dependent on adequate nerve flow. To ensure that this is occurring and is properly evaluated in cases of DM, additional, specialties need to be added to the treatment team.

Neurology

From the neurologic viewpoint, a comprehensive evaluation of the muscle is best accomplished with Nerve Conduction Studies (NCS) and Electromyography (EMG) and a biopsy [3]. Perifascicular atrophy and inflammation in and around myofibrils interfere with nerve flow to the muscle. Neurologic testing at the beginning of treatment and periodically after helps to monitor the quantity and quality of muscle stimulations and extent of inflammatory interference.

CAMS

Complementary and Alternative Medicine Specialties (CAMS) can be used to augment the treatment of DM and

serve to reduce some of the quantity of potentially harmful immunosuppressive medications. Acupuncture, Chiropractic, Massage therapy and Nutrition should all be considered as viable additions to the Dermatomyositis treatment team.

Acupuncture may contribute to decreasing the inflammation which occurs in DM by increasing anti-inflammatory cytokines and decreasing those that promote inflammation [16]. With the belief that there exists in the body circular pathways known as meridians, acupuncture seeks to balance the energy which flows through these pathways. When inflammation is present in the skin or muscles there is an interruption of energy. Anti-inflammatory medications do nothing to re-establish this energy which has been blocked. The skin or muscle region remains out of balance which creates the likelihood that inflammation will return.

Chiropractic's primary goal is to locate and remove nerve interference primarily along the vertebral column but also in the extremities. Because spinal segments have a neurologic, muscular, cardiovascular and lymphatic component, four body systems are directly and the remaining seven, indirectly influenced by a Spinal Manipulation (SM). Those afflicted with DM experience difficulty in movements controlled by proximal muscles such as the deltoids of the shoulder and quadriceps of the lower limb [14]. The decreased mobility results in interference with the four components of the spinal segments related to these groups. Muscles attach to bone and when the muscle no longer moves normally the bones attached also lose normal range of motion. This event compromises the delivery of nutrients and the draining of waste products from the area afflicted. Currently, it is believed that DM is a disease related to immune system compromise. SM has been shown to affect the sensory pathways located within the spinal cord. These pathways influence nerve flow to the sympathetic nervous system [17]. It has been further shown that the immune system is controlled by these nerves [18].

As valuable parts of the treatment team, acupuncture and chiropractic may help to alleviate the symptoms caused by DM without delivering the potentially harmful side effects the current drug protocol may cause. In the case of prednisone and methotrexate the goal is to inhibit inflammation but these drugs do nothing to re-establish muscle physiology or energy balance.

Massage Therapy has been shown to decrease inflammatory cytokines, IL-4 and IL-10 while also reducing the primary stress hormone cortisol [19]. Massaging a muscle is the most rudimentary form of exercise it can undergo. The pressure of massage promotes circulation which stimulates the movement of oxygen and other nutrients into the tissues.

Nutrition can play a vital role in the treatment of Dermatomyositis symptomatology. Dysphagia is a possible complication in people with DM which requires a change in how food is consumed. Softer food and fortified liquids are often the first treatment considerations. Patients are advised to sip fluid between bites to promote movement into and down the oesophagus. The intake of protein is important in this condition and can be maintained by adding yogurt or pureed meats to the diet in soups or smoothies [20].

Non-Clinical possibilities for the treatment of DM could include common practices such as yoga, deep breathing and relaxation exercises. Each of these relies on an individual's ability to focus their mind and body to try to reach physical or emotional goals. It is well known that one can affect physiological processes such as heart or respiratory rate through relaxation techniques. An individual with DM experiences both inner (muscular) and outer (skin) symptomatology. The ability to take part in practices designed to reduce physical and mental stress could benefit those afflicted with the disease.

An Integrative Approach to Dermatomyositis

Dermatomyositis is a complex disease with signs and symptoms that do not always equate to the physical condition of the individual. Blood markers like CK and aldolase may be high without symptoms being present or low with the person showing acute skin and or muscle involvement. In addition, these markers do not always agree, CK may be normal with increased aldolase [21]. Muscle weakness may arise from numerous causes including neurologic, bacterial and viral [22]. For these reasons, the treatment of DM would benefit from a comprehensive, integrative approach. This approach would call upon the expertise of dermatology, rheumatology and neurology but should also include chiropractic, physical therapy, acupuncture and massage therapy. The aggressive use of CAM specialties in particular, could reduce the individual's exposure to potentially harmful side effects from medications.

Conclusion

Analysis and treatment of a disease that affects those afflicted in different ways requires the skills and tools of many health professionals. The varied presentations displayed by those suffering with DM exceed the expertise of a single caregiver. Each subtle sign and symptom associated with the disease must be appreciated and carefully noted in order to properly diagnose and treat the condition. Presently Dermatomyositis has no definitive cure, however, is it possible that this is due to an incomplete analysis of the condition of the body in which it is suspected to reside?

The integration of multiple healthcare specialties each focusing on the way specific body systems are working and noting the signs and symptoms of the disease itself may lead to a different and more complete treatment protocol. Instead of the administration of a medication for a set amount of time with a second drug choice set to follow, would it not be more appropriate to use the proven alternatives mentioned in this paper at the outset

of treatment alongside the standard drug therapy? Collaboration among healthcare specialties results in positive outcomes in patient management and response to treatment [23]. Persons afflicted with Dermatomyositis should also experience more positive results with the team approach this paper has illustrated.

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