

Yoga as a Novel Adjuvant Therapy for Patients with Idiopathic Inflammatory Myopathies

Abstract

Context: Recent studies have demonstrated that physical activity is well tolerated by patients with idiopathic inflammatory myopathies (IIMs) and can have additional benefits as an adjuvant therapy to pharmacologic agents, especially if started early. To date, no studies have examined the effects of yoga on patients with IIMs. **Aims:** The aim of this study was to evaluate the effects of yoga on self-reported difficulty in performing activities of daily living (ADL) and muscle strength in patients with mild-to-moderate IIMs. **Subjects and Methods:** A longitudinal cohort study in which participants were assessed using the Myositis Activities Profile (MAP) and manual muscle testing (MMT) before and after the completion of an 8-week instructor-guided yoga course was performed. **Statistical Analysis Used:** Wilcoxon signed-ranked test was performed for statistical analysis. **Results:** The average posttreatment MAP scores of six participants demonstrated an increase of 2.51 points, while the average MMT score of four participants demonstrated an increase of 11 points. **Conclusions:** This study is the first study to date to examine the effect of yoga as an adjuvant complementary therapy for patients with IIM. Continued research should be done on the effect of yoga as an adjuvant therapy, for in addition to increase in muscle strength and ability to perform ADL, yoga may offer potential improvements in mood, mental health, and sleep.

Keywords: Health, myositis, quality of life, rheumatic disease, yoga

Introduction

Idiopathic inflammatory myopathies (IIMs), such as polymyositis (PM) and dermatomyositis (DM), are rare yet potentially devastating autoimmune processes affecting approximately 10 in 100,000 globally.^[1] Clinical presentations of IIMs can vary widely, ranging from isolated mild muscle weakness to debilitating muscle weakness and pain that are resistant to treatment.^[2] Recent studies have demonstrated that physical activity is not only well tolerated by patients with IIMs but can have additional benefits as an adjuvant therapy to pharmacologic agents, especially if started early.^[3] However, to date, no study has investigated yoga as a potential adjunctive therapy for IIMs. This study aims to evaluate the effects of weekly yoga sessions as a new adjuvant therapy in patients with mild-to-moderate IIMs.

Subjects and Methods

To analyze the efficacy of yoga on IIMs, longitudinal cohorts who would be given

supplementary weekly yoga therapy sessions in addition to their current pharmacologic treatment plans were recruited from an ambulatory setting rheumatology clinic. To be included in the study, patients had to be adults over the age of 18 years, diagnosed with mild-to-moderate IIMs (PM or DM) by a board-certified rheumatologist, willing to answer questionnaires and undergo manual muscle testing (MMT), not currently hospitalized, and not currently pregnant. Screening for the inclusion criteria was done by the rheumatologist following the patients at the time of the recruitment. All protocols and materials were approved by the institutional review board following human rights and in compliance with the Helsinki Declaration. Informed consent was obtained from all individual participants before the start of the study.

Two separate cohorts were created. The first cohort completed on-site yoga sessions, while the second cohort completed video-conference yoga sessions. All participants in both cohorts engaged in

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8 weekly yoga sessions taught by the same yoga instructor. Patients were also given a list of movements they were to perform one other time per week at home [Appendix I].

A total of eight participants were recruited for the study: four participants for the on-site yoga cohort and four participants for the video-conference yoga cohort. Each participant was assessed twice: once before participating in any yoga therapy and once after completing the 8 weekly yoga sessions. Assessments consisted of the Myositis Activities Profile (MAP) questionnaire and the MMT. The MAP is a questionnaire that evaluated limitations in activities of daily living (ADL), with higher scores representing greater limitations. The MAP was the first disease-specific activity limitation questionnaire developed for people with inflammatory myositis.^[4] The MAP questionnaire is composed of four different categories of ADL - movement, activities of moving around, personal care and hygiene, and domestic activities. Meanwhile, the MMT is a series of physical tests performed by a trained physical therapist to evaluate the muscle strengths of three different muscle groups – axial, proximal, and distal, with higher scores representing greater muscle strength.^[5] Six participants' pre- and post-treatment MAP scores and four participants' pre- and post-treatment MMT scores were recorded and analyzed using the Wilcoxon signed-rank test for statistically significant mean difference between the pre- and post-treatment MAP and MMT scores.

Results

Six participants' pre- and post-treatment MAP scores were collected and analyzed. Two participants ended up dropping out of the study, and thus their posttreatment MAP scores could not be collected. The average MAP score of the six participants before the initiation of the yoga adjuvant therapy was 66.67 with a standard deviation of 25.34. Meanwhile, the average posttreatment MAP score was 69.17 with a standard deviation of 30.71. Due to the small sample size ($n = 6$), the legitimacy of the normal distribution assumption could not be confirmed. The Wilcoxon signed-rank test indicated that, at 5% significance level, there were no significant differences between pre - and post-treatment MAP score, P value of 0.69.

Further analysis of the results from the MAP questionnaire was done based on the individual categories of ADL. Figure 1 illustrates the number of participants who improved, worsened, or saw no effect for each category. Notable improvements occurred in categories of personal care and hygiene and domestic activities [Figure 1].

Four participants' pre- and post-treatment MMT scores were collected and analyzed. In addition to the two patients who dropped out of the study, two more patients' posttreatment MMT score could not be obtained due to the fact that the physical therapist performing the MMT

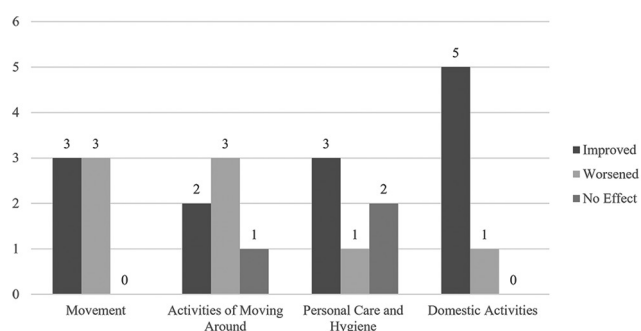


Figure 1: Summary of Myositis Activities Profile questionnaire. Graph of the four categories that constitute the Myositis Activities Profile and the number of participants who improved, worsened, or saw no effect in each category post 8-weekly yoga sessions

relocated during the study period. The average MMT score of the four participants before the initiation of the yoga adjuvant therapy was 217.25 with a standard deviation of 41.65. Meanwhile, the average posttreatment MMT score was 228.25 with a standard deviation of 23.99. Again, due to the small sample size ($n = 4$), the legitimacy of the normal distribution assumption could not be confirmed. The Wilcoxon signed-rank test indicated that, at 5% significance level, there were no significant differences between the pre- and post-treatment MMT score, P value of 0.50.

Further analysis of the results from the MMT was done based on the individual categories of the muscle groups tested. Figure 2 illustrates the number of participants who improved, worsened, or saw no effect for each muscle group. Notable improvements occurred in the proximal and distal muscle groups [Figure 2].

Discussion

Much remains unknown about the disease and how to best provide treatment for patients with IIMs. Only a limited number of large randomized clinical trials have been conducted for the treatment of IIMs. Early initiation of treatment, particularly within 6 months to 1 year from onset of symptoms, has been shown to lead to better outcomes.^[6] Currently, the standard armamentarium for autoimmune disease is used, with glucocorticoids and complementary immunosuppressive agents being favored as the first line of treatment.^[7] However, despite initial improvements, strong efforts are made to taper patients to their lowest tolerated dose of glucocorticoids due to the side effects associated with long-term corticosteroid use.^[8] Recently, the use of biologic agents such as rituximab, tocilizumab, and abatacept has become an area of intense interest as early results have shown favorable outcomes.^[9] However, biologic agents can be very costly, and despite the strides that have been made in the management, even with adequate treatment, many patients still experience decreased muscle endurance and strength as the disease progresses.^[10] Thus, a need exists for adjuvant therapeutic options.

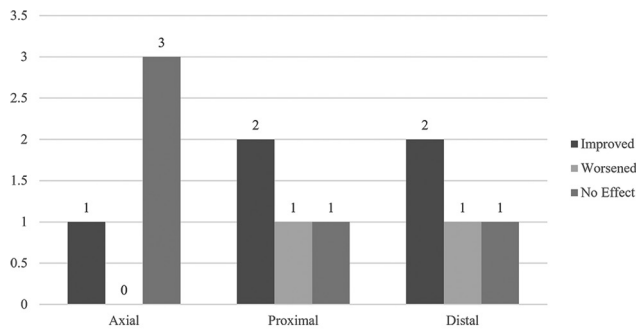


Figure 2: Summary of Manual Muscle Test. Graph of the three muscle groups tested on the Manual Muscle Test and the number of participants who improved, worsened, or saw no effect for each muscle group post 8-weekly yoga sessions

The results of this study did not demonstrate statistically significant differences between pre- and post-yoga therapy. However, the hope is to highlight the potential benefits of yoga therapy beyond what was measured by the MAP and MMT and to increase awareness of yoga as an adjuvant therapy for IIMs. The results from this study demonstrated an 11-point increase in the average posttreatment MMT score, with a net increase in muscle strength in every category of the MMT. Despite seeing an increase in the average posttreatment MAP score, a closer analysis demonstrated net improvements in patients' ability to perform ADL in every category of the MAP questionnaire except for one – movement.

Interestingly, the benefits of yoga may be greater than what was reflected through the MAP and MMT scores. Yoga has been shown to lead to improvements in emotional, mental, and psychological well-being beyond what is expected from traditional aerobic and strength exercises.^[11,12] Furthermore, yoga has been shown to greatly improve gait, balance, flexibility, and pain.^[13] Finally, yoga may be particularly beneficial in the elderly, where limitations in mobility and exercise nonadherence are of major concerns.^[14] The ability of yoga to be modified to less demanding physical requirements lends itself to be recommended to more individuals with varying levels of physical capabilities.^[15]

It should be noted that there are clear limitations to this study. First, a limited number of participants who entered the study finished the 8-week protocol. Several efforts were made to recruit more participants, but they were ultimately unsuccessful. Despite starting with eight participants, two participants dropped out of the study before the completion of the study. In addition, the physical therapist performing the MMT relocated during the study period, leaving two more participants without posttreatment MMT scores. Thus, only six participants' pre- and post-treatment MAP scores and four participants' pre- and post-treatment MMT scores were analyzed. Another limitation was that the study period only consisted of 8 weekly yoga sessions. Thus, a generalization of the results is limited to short-term effects of yoga therapy.

Future studies should look to recruit a greater number of participants with easier to access virtual-yoga sessions, especially given the physical distance precautions in the COVID-19 era, as well as conducting the study for a longer time period to allow evaluation of the long-term effects of yoga therapy. Finally, additional assessment tools should be considered to get a more accurate assessment of the benefits offered by yoga therapy.

Conclusions

Physical activity is an important part of a healthy lifestyle. For patients with IIMs, long-term disability and physical inactivity due to pain and weakness are very common, especially in the later stages of the disease. Yoga has numerous theoretical benefits compared to aerobic and strength exercises and further studies into the effect of yoga on IIMs should be considered as a new alternative means of physical activity. To date, this is the first and only study to look into the effect of yoga on IIMs.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Appendix

Yoga for Inflammatory Myositis

Autoimmune disease can be frustrating, uncomfortable, and even debilitating. However, natural remedies like yoga can be extremely beneficial for treating many of these diseases.

- **Yoga decreases stress.** Yoga helps you to have a sense of calm and well-being. This sense of calm helps to decrease stress, helping lower the release of stress hormones that compromise the immune system
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- **Yoga increases Immunity.** Yoga stimulates the parasympathetic nervous system (our rest and digest state), which reduces the body's stress response (flight or fight state) and helps to bring the nervous system into balance. This is shown to have a profound effect on the immune system. It also helps to condition the lungs and respiratory tract, stimulating the lymphatic system, releasing toxins from the body and drawing oxygenated blood back into various organs to ensure optimal functioning.
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- **Yoga reduces inflammation.** Regular yoga practice is shown to reduce levels of inflammatory markers in the body. Sometimes when the immune system sends out extra white blood cells without anything negative to attack, they inflame nearby healthy tissue.
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- **Yoga brings inner peace.** Yogic practices, such as meditation and calming yoga poses, help you find an inner connection, teaching you to be able to shift your focus away from pain or discomfort and into a pleasant state of being. It gives you tools to be able to focus your attention away from pain. Yoga also teaches you to listen to your body and to treat yourself with compassion and kindness, honoring what your body needs.

Before you start:

- Wear loose clothing.
- Find a comfortable space to practice - it doesn't have to be big.
- Find any props you might want – perhaps a mat, blankets, wall space or a chair.




- **Plan your practice time - it doesn't have to be long; you can start small at first.**

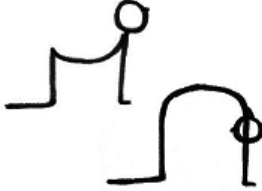


How to practice:

- **Bring an attitude of curiosity.**
- **Explore your poses – don't worry about your performance.**
- **Move slowly and mindfully so that you notice and feel the poses.**
- **Be kind to yourself – there's no "right" or "wrong" in yoga.**
- **Observe your breath – it can help you connect your body and mind. • Rest when you need to - be guided by how you feel.**
- **Notice how you feel after each pose. Are there any changes?**
- **Remember that your yoga practice an act of self-care.**

Sequence of Yoga Poses

Please read thoroughly before attempting this sequence

<p><u>Resting Pose</u></p> 	<p><u>How To</u></p> <ul style="list-style-type: none"> - Lie on back, knees bent with feet on floor. - Perhaps place one hand on heart and one hand on belly. - Breathe easily and naturally; feel the rise and fall of breath in your body. - After some time, you may want to gently lengthen your exhalation without straining; it might feel like a gentle sigh. 	<p><u>Benefits</u></p> <ul style="list-style-type: none"> - Grounding and relaxing. - Promotes awareness of breath.
<p><u>Little Boat</u></p> 	<p><u>How To</u></p> <ul style="list-style-type: none"> - Lie on back. - Bend knees towards chest. Knees can be apart or together. - Hands might rest on shins or knees. - Explore rocking side to side if you wish. 	<p><u>Benefits</u></p> <ul style="list-style-type: none"> - Massages lower back. - Rocking may be soothing.
<p><u>Table</u></p> 	<p><u>How To</u></p> <ul style="list-style-type: none"> - Come to hands and knees on the ground. - Place hands under shoulders, and knees under hips. - Press hands in to the floor. - Feel arms firm. - Notice your centre as you begin to gently hug in your lower belly. - Perhaps shift your weight around. - Sway hips side to side. 	<p><u>Benefits</u></p> <ul style="list-style-type: none"> - Grounding. - Builds support and stability.

 <p>Cat/Cow</p>	<p>How To</p> <ul style="list-style-type: none"> - On hands and knees, inhale and gently arch your back (lifting chin and tailbone) - As you exhale, round your spine like an angry cat and draw lower belly in and up. - Slowly move back and forth between these two shapes with breath. 	<p>Benefits</p> <ul style="list-style-type: none"> - Wakes up the spine. - Links movement and breath. - Centering.
<p>Child's Pose</p> 	<p>How To</p> <ul style="list-style-type: none"> - You may wish to have an extra blanket to pad your knees. - From hands and knees, shift hips back towards heels. - Knees could be together or apart. - You may bring arms forward in front of you or place them alongside your torso, or stack fists and rest your forehead on top of fists. - Try to rest your head on something. - If you are stiff or have knee issues, place a folded blanket between hips and knees. - Breathe naturally. 	<p>Benefits</p> <ul style="list-style-type: none"> - Helps to lengthen your spine. - Grounding. - May promote a feeling of rest and safety.
<p>Mountain Pose</p> 	<p>How To</p> <ul style="list-style-type: none"> - Come up to a standing position. - Place feet hip distance apart. - Spread toes and press feet into ground. - Firm the legs, hug lower belly in, feel length in your spine, relax shoulders, the skin on your face and jaw. - Breathe in to stand taller and as you exhale, connect feet to the earth. - Eyes may be open or closed. - This can be done holding on to a chair 	<p>Benefits</p> <ul style="list-style-type: none"> - Grounding. - Centering. - Stabilizing. - Promotes body awareness.