

## Effect of integrated Naturopathy and Yoga interventions in a patient with seronegative Rheumatoid Arthritis- A single Case Report

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### ABSTRACT:

Rheumatoid Arthritis (RA) is a chronic, non-suppurative, systemic inflammatory auto-immune disease of unknown cause characterized by symmetrical polyarthritis and extra-articular manifestations. Seronegative RA differs in its perspective on diagnosis and treatment from that of seropositive RA. The effect of integrated naturopathy and yoga intervention on seropositive cases is well established. Yet the effect of integrated naturopathy and yoga interventions on seronegative cases is still unexplored. A 17-year-old female complained of swelling, stiffness, and pain in the wrist and inter-phalangeal joints of both hands for one year. She had a negative rheumatoid factor and was diagnosed with seronegative RA. We treated her with integrated naturopathy and yoga interventions for 30 days. She had shown a reduction in pain and stiffness along with improvements in her perceived stress score, sleep quality, and disease activity score. Hence, integrated naturopathy and yoga interventions can be effectively used to treat patients with seronegative RA.

**KEYWORDS:** Autoimmune Diseases, Complementary therapy, Pain management, Rheumatoid arthritis.

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## INTRODUCTION

Seronegative rheumatoid arthritis (RA) is a phenotype of rheumatoid arthritis without the presence of rheumatoid factor (RF) and anti-citrullinated peptide antibody (ACPA) [1]. It's an immune-dysregulating and systemic inflammatory disorder that mainly affects diarthrodial joints [2]. The prevalence is three times higher in women than in men. However, pathological, molecular, and cellular mechanisms remain poorly understood. Clinical features of RA include joint swelling, pain, stiffness, weakness, fatigue, malaise, fever, weight loss, and depression [3]. Previous studies on RA explain the importance of an appropriate diagnosis and the earlier onset of intervention to suppress the inflammation [4]. A few studies show better clinical outcomes in seronegative patients than in seropositive RA cases [5]. In India, naturopathy and yoga are the most widely used complementary and integrative medical systems [6]. The effect of integrated naturopathy and yoga treatments on seropositive cases along with other comorbidities has already been shown in previous studies [7]. There is a lack of evidence regarding the effect of integrated naturopathy and yoga interventions on recently diagnosed seronegative RA cases. Thus, this case report presents the positive effect of integrated naturopathy and yoga interventions on a seronegative case of RA.

## CASE DESCRIPTION:

A 17-year-old female pre-diagnosed with seronegative RA visited OPD with a complaint of pain and stiffness in the interphalangeal joint and wrist of her right and left hand. On physical examination, stiffness and swelling were present in the interphalangeal joints of the little finger, ring finger, and index finger of the right hand and wrist. On the left hand, tenderness is seen in the interphalangeal joints of the

index and middle fingers. The swelling was seen in the interphalangeal joints of the index, middle, and left wrist joints. She doesn't seek out any conventional methods of treatment during the early stage of the ailment because the pain is considerably more tolerable. As the ailment worsened, her academic and personal growth was limited due to increased pain intensity and stiffness. She was diagnosed with seronegative RA in December 2019 after a consultation with an orthopaedic surgeon. She underwent an MRI in January 2019, which identified the likelihood of RA involving the radioulnar carpal and proximal interphalangeal joints with thickening of the synovium.

## TREATMENT PLAN:

After consultation, we planned an integrative treatment protocol that included yoga practices, naturopathic interventions, and acupuncture (Table 1, 3; and Figures 1–3). Treatment was done on a regular basis in the outpatient department for a period of 30 days. Before the beginning of the therapeutic interventions, written informed consent was obtained. At the end of the treatment, she was asked to practise yoga regularly and to revisit the hospital if pain, stiffness, or swelling recurred. A two-year telephone follow-up was also conducted.

## ASSESSMENT CRITERIA:

The following scales are used to assess the outcome of the patient's condition before and after the intervention. A visual analogue scale was utilised to assess the intensity of pain [8]. The Pittsburgh sleep quality index is used to assess the patient's sleep quality [9]. A patient health questionnaire is used to assess the level of depression in patients with non-psychiatric disorders [10]. The stress scale is used to measure the perception of stress [11]. The 10-meter walk test scale shows the

functional ability and walking speed of the patient [12]. An isometric hand grip test is used to indicate muscle strength [13]. The toe-touch test is used to assess the relationship between fingertip-floor distance along with the range of flexion of the hip joint and vertebrae of the trunk [14]. The Disease Activity Score-28 is a quantitative index that assesses swollen joints, tender joints, and the rate of erythrocyte sedimentation [15].

### RESULT:

In patients with seronegative RA, integrated naturopathy and yoga interventions were found to be effective in reducing pain and stiffness. In addition, the patient showed improvement in the patient health questionnaire, perceived stress scale, Pittsburgh sleep quality index, visual analog score, 10-meter walk test, disease activity score, isometric handgrip test, and toe touch test (Table 2).

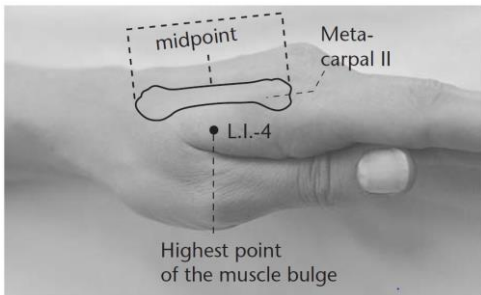
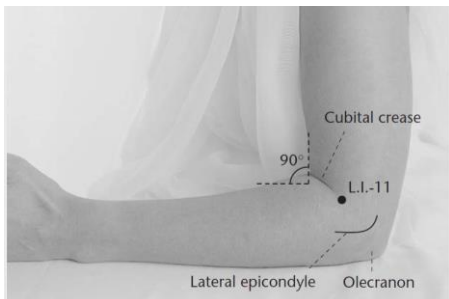
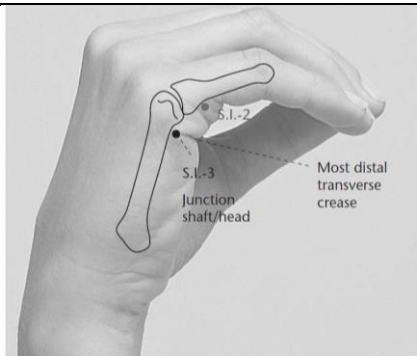
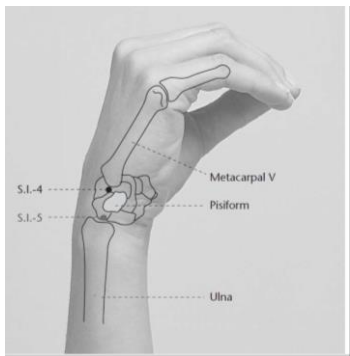
**Table 1: Details of the Naturopathy and Yoga interventions:**

Treatment	Duration	Number of days
<b>Naturopathy treatment</b> Partial massage with Lemon grass oil and gingelly oil (1:4 Ratio)	20 mins /daily	30 days
Infra-red radiation to both hands and wrist	5 mins/daily	30 days
<b>Yoga Therapy</b> <i>Suksma vyayama</i> Nadishoodhana pranayama Bhramari pranayama	20 mins /daily 10 mins/daily 10 mins/daily	30 days
<b>Acupuncture</b> Electro acupuncture (LI-4, LI-11, St-36, SI-3, SI -4) bilateral	20 mins/session	Alternate weeks

**Table: 2 Baseline characteristics and other outcome measurements:**

Name of the variable	Baseline	Post-intervention
Height	149 cm	149 cm
Weight	37 Kg	37 kg
Body mass index	16.4 kg/m <sup>2</sup>	16.4 kg/m <sup>2</sup>
Patient health questionnaire	12	5
Perceived stress scale	22	9
Pittsburg sleep quality index	9	5
10-meter walk test Average self-selected velocity Average fast velocity	1.23 m/s 0.89 m/s	0.95 m/s 0.63 m/s
Isometric hand grip test Right hand Left hand	19.3 mmHg 30.6 mmHg	51.6 mmHg 58.6 mmHg
Toe-touch test	20 cm	8 cm
Visual analog score	7	3
Disease activity score (28)	4.7	3.54

Table 3: An illustrative representation of Acupuncture points given to the patient

Points	Location
Large intestine 4 (LI-4)	
Large intestine 11 (LI-11)	
Small intestine 3 (SI-3)	
Small intestine 4 (SI-4)	

Stomach 36 (ST-36)

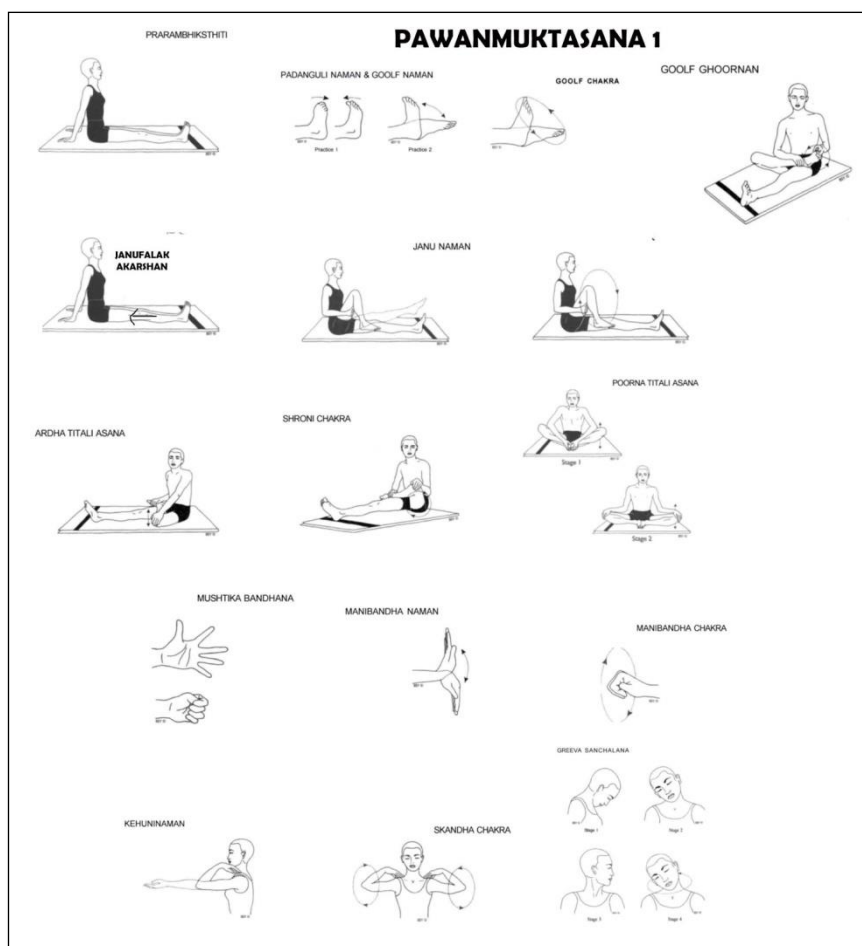
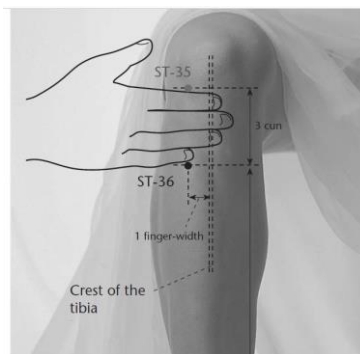
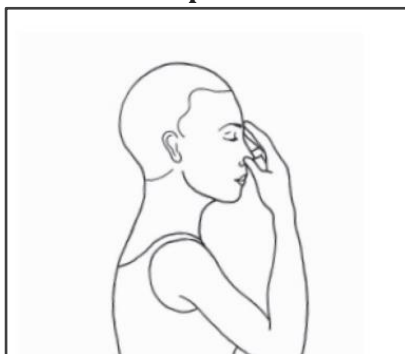


Figure 1: An illustrative representation of *sukshma vyayama*



**Figure 2: An illustrative representation of *Nadi shoodhana* pranayama**



**Figure 3: An illustrative representation of *Bhramari* pranayama**

## DISCUSSION

This is the first-ever case report to be published on seronegative RA showing the efficacy of integrated naturopathy and yoga interventions. Previous research on naturopathy and yoga interventions for seropositive cases of RA along with other co-morbidities found a reduction in inflammatory markers like IL-1, cortisol, IL-6, and TNF- $\alpha$ , as well as an improvement in quality of life [7]. The patient had received naturopathy and yoga intervention only after two years of disease onset, despite the fact that naturopathy and yoga had shown a positive role in reducing pain, stiffness, and swelling. Sukshma vyayama (a group of specific joint exercise movements with breathing synchronization) involves all the joints and muscles of the body. The possible mechanism of action would be the strengthening of joints, and improvement of flexibility and muscle tone, which have significantly reduced stiffness, pain, and swelling [16-18].

Pranayama, known to activate the parasympathetic system and bring about sympathovagal balance, contributed to the reduction in stress and is rooted in the sense of well-being [19]. The two pranayama

techniques taught to the patient have been shown to increase the expression of DNA repair genes, lower levels of inflammatory cytokines like interleukin-6 (IL-6), and increase levels of anti-inflammatory cytokines like IL-2 and IL-4 [20]. Partial massage involves systematic manipulation of joints, which includes touch, friction, stroking, and joint movements together with the application of essential oil. Lemongrass has an active biological constituent (citral) that has anti-inflammatory and analgesic properties. It also boosts circulation and eases stiffness [21,22]. It is evident that the production of endorphins and the reduction in the secretion of the adrenocorticotrophic hormone during a massage have reduced inflammation significantly [23].

The superficial application of infrared radiation to the affected joints of the body results in mild heating that is effective in relieving pain because of its sedative effect on superficial sensory nerves. It also induces muscle relaxation, improves blood circulation, accelerates the removal of waste products, and resolves inflammation [24]. Acupuncture at local points (SI-3, SI-4), results in the activation of mechano-



receptors and afferent pathways of the ventrolateral tract, significantly reducing pain. Electroacupuncture at ST-36 reduces TNF- levels, which play a major role in the reduction of inflammation in the patient [25]. Electroacupuncture at ST-36 and LI-11 modulates pain intensity by increasing 5-HT levels [26]. Acupuncture aids in the production of endogenous opioids and serotonin, which produce a sense of well-being and decrease pain by modulating the pain gate pathway [27-29].

Therefore, the possible mechanism of action of integrated naturopathy and yoga interventions on seronegative RA might be due to enhancement of parasympathetic activity, reduction of pro-inflammatory cytokine levels, enhancement of endogenous opioid secretion, or reduction of stress levels. Thus, for patients with an early diagnosis and subsequent commencement with naturopathy and yoga interventions, it will help to prevent further harm to the joints and organs.

#### **CONCLUSION:**

This case report demonstrates that there is notable improvement in seronegative RA with the use of naturopathy and yoga interventions, and further randomised control trials need to be done to confirm the effectiveness of the intervention.

#### **LIMITATION:**

The only limitation to the report was not using an inflammatory marker profile as a tool of investigation.

#### **STATEMENT OF TRANSPARENCY:**

The authors state that all the information contained in these pages is true, honest and transparent, that no aspect of the case was omitted, and that all relevant characteristics or differences were exposed.

#### **ETHICAL CONSIDERATIONS:**

Informed written consent was obtained from the patient for the publication of the case report.

#### **REFERENCES**

1. Paalanen K, Puolakka K, Nikiphorou E, Hannonen P, Sokka T. Is seronegative rheumatoid arthritis true rheumatoid arthritis? A nationwide cohort study. *Rheumatology*. 2021;60(5):2391-5.
2. Lee, D M, and M E Weinblatt. "Rheumatoid arthritis." *Lancet* (London, England) vol. 2001;358(9285):903-11
3. Gulati M, Farah Z, Mouyis M. Clinical features of rheumatoid arthritis. *Medicine*. 2018 Apr 1;46(4):211-5.
4. Monti S, Montecucco C, Bugatti S, Caporali R. Rheumatoid arthritis treatment: the earlier the better to prevent joint damage. *RMD open*. 2015;1(Suppl 1):e000057.
5. Paalanen K, Rannio K, Rannio T, Asikainen J, Hannonen P, Sokka T. Does early seronegative arthritis develop into rheumatoid arthritis? A 10-year observational study. *Clin Exp Rheumatol*. 2019;37(1):37-43.
6. Maheshkumar K, Venugopal V, Poonguzhali S, Mangaiarkarasi N, Venkateswaran ST, Manavalan N. Trends in the use of Naturopathy and yogabased lifestyle clinics for the management of Non communicable diseases (NCDs) in Tamilnadu, South India. *Clinical Epidemiology and Global Health*. 2020;8(2):647-51.
7. Arthia R, Maheshkumar K, Venugopal V, Mangairkarasi N, Manikannan M, Poonguzhali S. Anti-arthritis effect of leaf of *Cardiospermum halicacabum* juice in patients with rheumatoid arthritis-a case report.

- PharmaNutrition. 2019 Dec 1;10:100170.
8. Crichton N. Visual analogue scale (VAS). J Clin Nurs. 2001 Sep 1;10(5):706-6.
9. Carpenter JS, Andrykowski MA. Psychometric evaluation of the Pittsburgh sleep quality index. Journal of psychosomatic research. 1998 Jul 1;45(1):5-13.
10. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. Journal of general internal medicine. 2001 Sep;16(9):606-13.)
11. Cohen S, Kamarck T, Mermelstein R. Perceived stress scale. Measuring stress: A guide for health and social scientists. 1994;10(2):1-2.
12. Amatachaya Kwanmongkolthong M, Thongjumroon A, Boonpew N, Amatachaya P, Saensook W, Thaweewannakij T, Hunsawong T. Influence of timing protocols and distance covered on the outcomes of the 10-meter walk test. Physiotherapy theory and practice. 2020 Dec 1;36(12):1348-53S.
13. Trampisch US, Franke J, Jedamzik N, Hinrichs T, Platen P. Optimal Jamar dynamometer handle position to assess maximal isometric hand grip strength in epidemiological studies. The Journal of hand surgery. 2012 Nov 1;37(11):2368-73
14. Kippers V, Parker AW. Toe-touch test: a measure of its validity. Physical Therapy. 1987 Nov 1;67(11):1680-4.]
15. Van Riel PL. The development of the disease activity score (DAS) and the disease activity score using 28 joint counts (DAS28). Clin Exp Rheumatol. 2014 Sep 1;32(5 Suppl 85):65-74.]
16. Leibel LL, Metri KG, Prasad R, Mears JG. The effect of sukshma vyayama joint loosening yoga on aromatase inhibitor-induced arthralgia (AI) in breast cancer patients: A feasibility study conducted on Facebook.
17. Kuppusamy, Maheshkumar, Kamaldeen, Dilara, Pitani, Ravishankar, Amaldas, Julius, Ramasamy, Padmavathi, Shanmugam, Poonguzhali and Thirupathy, Venkateswaran Sankaralingam. "Effect of Bhramari pranayama practice on simple reaction time in healthy adolescents - a randomized control trial" International Journal of Adolescent Medicine and Health, vol. 33, no. 6, 2021, pp. 547-550.
18. Shobana, R; Maheshkumar, K; Venkateswaran, S.T.; Geetha, M Bagavad,; Padmavathi, R. Effect of long-term yoga training on autonomic function among the healthy adults. Journal of Family Medicine and Primary Care 2022;11(7): 3471-3475.
19. Rohini, P., Roopa, S., Padmavathi, R. and Maheshkumar, K. "Immediate effects of the practise of Sheethali pranayama on heart rate and blood pressure parameters in healthy volunteers" Journal of Complementary and Integrative Medicine, vol. 19, no. 2, 2022, pp. 415-418. <https://doi.org/10.1515/jcim-2020-0448>.
20. Gautam S, Tolahunase M, Kumar U, Dada R. Impact of yoga based mind-body intervention on systemic inflammatory markers and co-morbid depression in active Rheumatoid arthritis patients: A randomized controlled trial. Restorative neurology and neuroscience. 2019 Jan 1;37(1):41-59.
21. Meenapriya M, Priya J. Effect of lemongrass oil on rheumatoid arthritis. Journal of Pharmaceutical Sciences and Research. 2017 Feb 1; Vol. 9(2), 237-239



22. Olorunnisola SK, Asiyanbi HT, Hammed AM, Simsek S. Biological properties of lemongrass: An overview. *International Food Research Journal*. 2014 Mar 1;21(2):455.
23. Rapaport MH, Schettler P, Bresee C. A preliminary study of the effects of a single session of Swedish massage on hypothalamic-pituitary-adrenal and immune function in normal individuals. *The Journal of Alternative and Complementary Medicine*. 2010 Oct 1;16(10):1079-88.
24. Textbook of Electrotherapy by Jagmohan singh, New Delhi, edition :2018
25. Peng MF, Li K, Wang C, Zhu XY, Yang Z, Zhang GH, Wang PH, Wang YH, Tang LJ, Zhang L. Therapeutic effect and mechanism of electroacupuncture at Zusanli on plasticity of interstitial cells of Cajal: a study of rat ileum. *BMC complementary and alternative medicine*. 2014 Dec;14(1):1-0.
26. Zhu X, Liu Z, Qu H, Niu W, Gao L, Wang Y, Zhang A, Bai L. The effect and mechanism of electroacupuncture at LI11 and ST37 on constipation in a rat model. *Acupuncture in Medicine*. 2016 Jun;34(3):194-200.
27. Wilkinson J, Faleiro R. Acupuncture in pain management. Continuing education in anaesthesia, critical care and pain. 2007 Aug 1;7(4):135-8.
28. Clement-Jones V, Tomlin S, Rees L, Mccloughlin L, Besser GM, Wen HL. Increased  $\beta$ -endorphin but not met-enkephalin levels in human cerebrospinal fluid after acupuncture for recurrent pain. *The Lancet*. 1980 Nov 1;316(8201):946-9.
29. Deenadayalan B, Venugopal V, Poornima R, Yogapriya C, Akila A, Pandiaraja M, Poonguzhali S, Maheshkumar K. Analgesic Effect of Hydrotherapy: A Narrative Review of Current Evidence. *CANDJ*. 2022 Dec. 15;29(4):12-5.

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