

Levels of inflammatory markers (ESR, TNF- α) and DAS28 in Rheumatoid Arthritis patients

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Abstract

Rheumatoid Arthritis (RA) is an autoimmune disease which has its effect on life style of the patients. Naturopathy is a simple and effective system of medicine which has taken its scientific form today. The thought of bending, stretching, twisting into, and then holding, pretzel-like poses while your joints are inflamed may sound impossible. RA may causes inflammation of the joints and other tissues in the body; it can be controlled by the Naturopathy like massage, hot & cold fomentation and Yoga like pawanamuktasana series part -I which has no side effects. During the three month study DAS28 & ESR was monitored. With the application of naturopathy & yoga DAS28 score found $p > 0.0001$ which is more statistically significant and ESR score found $p = 0.0210$ which is considered to be statistically significant. Traditionally used technique like naturopathy improved metabolism of various organs of the body & yoga is helpful in strengthen the muscles & joints of the patients which further improved the life style of RA patients.

Keywords: Naturopathy; Yoga; DAS28; ESR.

Introduction

Naturopathy is a science which uses natural elements for the improvement of immune system of the body, with the help of massage, diet and yoga we can improve the immune system, which provide the better living condition for the patients of rheumatoid arthritis. Rheumatoid arthritis (RA) is a complex disorder in which disease activity produces symptoms and damage the tissues

present between the joints, which in turn lead to personal and societal consequences[1-5], including work disability[1,6-13], high rates of service utilization[14-19], and premature mortality[1,20-27], which cause swelling, tenderness at the small joints. Autoimmunity is the failure of body's own immune system to recognize self-tissues or cells. The resulting immune response leads to tissue damage that manifests as an autoimmune disease[28].

Severity of pain is in case of RA mostly ascribed to the degree of inflammation, the progress of joint damages and deviations[29] and although these symptoms could be improved by treatments wherewith also pain should temporarily relief, it could nevertheless be present to a high level[30-31]. The joints

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usually involved are the hands, wrists, feet, ankles and knees[32].

Experimental studies have shown that several inflammatory mediators, including activated leucocytes, cytokines and C-reactive protein (CRP), have an active role within the atherosclerotic plaques. Moreover, some large, prospective, epidemiological studies have shown that high serum levels of inflammatory markers, like hs-CRP[33,34] Anti-CCP[35], ANA[29,36], TNF-alpha[37-39] and RA-Titer[40-43] are predictive of future cardiovascular events[44-47].

Yoga and naturopathy are natural technique for reducing pain with increase range of motion, and the use of movement known as exercise therapy[48-50] for the improvement in disease activity score of arthritis patients. The practice of yoga might seem daunting to a person with rheumatoid arthritis (RA). The thought of bending, stretching, twisting into, and then holding, pretzel-like poses while your joints are inflamed may sound impossible. However, research has

shown that gentle yoga can be of great benefit as a rheumatoid arthritis treatment[51].

Naturopathy is a form of alternative medicine based on a belief in vitalism, which posit that a special energy called vital energy or vital force guides bodily processes such as metabolism, reproduction, growth, and adaptation[52]. Different treatment modalities of naturopathy like, Hydrotherapy, Massage Therapy, Mud Therapy, Diet Therapy etc., facilitate to keep the internal organs clean by removing the accumulated morbid matter from the tissues and strengthen them to perform their normal functions efficiently. Our aim of this study was to show the improvement in grip strength with the help of massage and yoga improvement in swelling, tenderness in rheumatoid arthritis patients which repels improvement in visual analog scale (VAS), inflammatory and immunological markers with the change in Disease Activity Score-28 (DAS-28) which shows the life style intervention of arthritis patients.

Table 1. Definitions of disease activity using DAS and DAS28^{53, 54, 55}

Definition	DAS	DAS28
Remission	< 1.6	< 2.6
Low disease activity	≤2.4	≤3.2
Moderate disease activity	> 2.4 and ≤3.7	> 3.2 and ≤5.1
High disease activity	> 3.7	> 5.1

Material and Method

Registration of Patients

The patients were invited for interventions, such as naturopathy, Yoga therapy and pharmacological treatment through random counseling at an individual schedule depending on health assessment questions according to American Criteria of Rheumatology (ACR) during the study period. Thus, the individual schedule included additional study follow-ups when necessary. In addition to individualized interventions, a patient education programme was offered to

all patients during the three month study period. Ongoing medication was registered at all visits. There were no differences taking between women and men regarding the health assessment question, visual analog score and grip strength respectively.

Treatment Technique

Naturopathy Treatment

a. Massage Therapy

Oil massage therapy will be applied to the interventional group for 30 min. which will enhance not only blood circulation but also

tone up the muscles while improving structural and functional status. Massage, when skillfully administered, has to do chiefly with the muscles. That form of manipulation which consists simply of skin pinching excited the nervous system and the surface circulation, but has little influence upon the muscles. When we reflect that the muscles constitute one half of the bulk of the body, and receive one fourth of all blood of the body, it is at once apparent that any procedure which acts directly upon them must have a decided influence upon the whole body. Although the muscles constantly receive a certain blood supply, this supply is comparatively small except during activity; consequently, it may be said that "the muscles are well fed only when exercising." When the muscle is inactive, the blood goes around it rather than through it; but the moment activity of the muscle begins, there is a great increase in its blood supply, even before any acceleration in heart activity has occurred.

b. Hot and cold fomentations

Hot water bag or cotton cold wrung in hot water for hot fomentations, a cold compress and a dry cold for cold fomentations are used. When the hot water bag is used, it is advisable to cover the application with a cotton cloth wrung in cold water. Fomentation is then

applied over it. After the application is over a cloth dipped in cold water should be placed on the same area for thirty sec. to two min. After removing the wet cold, it should be covered with a dry cloth for at least ten min. If the symptoms reoccur, the application should be renewed. All these hot water treatments will help to encourage the circulation of lymph and eliminatory channels that remove toxins from the body, which are stagnated in the body giving rise to decrease efficiency. These modalities also help in reducing swelling and congestion. For these modalities, temperature of water will be maintained at around 40-45°C, bearable to the patient. And if required, temperature can gradually be increased to 50°C.

c. Yogasana

Asanas have great effect on the pancreas and other glands. The muscle and organs of abdominal area are fully activated due to these asanas. Because of this activation the condition and functioning of the pancreas is energized and strengthened, it increases the blood supply to various part of the body, also has an effect on visceral receptor which stimulated the β cell of pancreas gland therefore increase insulin secretion in the body. Pranayamas are found to be useful in diabetes; it has calming effect on nervous system which reduces stress level.

Table 2. Yoga modalities

Sl. No.	Name of the Yoga	Duration
1	tadasana	3 min/day
2	katichakrasana	2 min/day
3	Uttanpadasana/Ardha	4 min/day
4	Pawanmuktasana	6 min/day
6	Bhujangasana	4 min/day
7	Salbhasana/Ardha	4 min/day
8	Dhanurasana/Saral	4 min/day
11	Shavasana	15 Min/day
12	Pranayama(Deep Breathing, Nadi Shodhana, Bhmrari)	11 min/day
13	Kapalbhati	2 min/day

Disease activity Score

The limitations of the ACR response criteria and the need for a continuous measure of disease activity led to the development of the DAS in 1993[56]. In first three month study disease activity was assessed according to the 28-joint count Disease Activity Score (DAS-28)[57]. Pain was reported on a 0-100-mm visual analogue scale (VAS), where 0 represents no pain and 100 mm represents worst possible pain[58-59]. Activity limitation was reported according to the 12 Health Assessment Questionnaire (HAQ), with a score as 0 corresponding to "without difficulty" 1 corresponding to "with some difficulty" 2 corresponding to "with much difficulty" and 3 corresponding to "unable to perform"[60-61], ESR tender and swollen joint count (28).

Result & Discussion

Massage generated heat with increased circulation in blood bringing down all the

impurities to the channel and expelling through sweat or urine. The muscle and organs of abdominal area are fully activated due to the yogasanas with improved blood supply. Massage will generate heat with increased circulation in blood bringing down all the impurities to the channel and expelling through sweat or urine. Cold Hip bath increases visceral circulation to abdomen and heightens nutritive process in the parts concerned. The muscle and organs of abdominal area are fully activated due to this asanas. Because of this activation the condition and functioning of the pancreas is energized and strengthened, it increases the blood supply to various parts of the body, improving insulin administration in the body. With the application of naturopathy & yoga DAS-28 score found (5.31 ± 0.93 vs. 6.89 ± 1.01); $p > 0.0001$ which is more statistically significant and ESR score found (36.50 ± 20.53 vs. 46.48 ± 24.03); $p = 0.0210$ which is considered to be statistically significant. Means and SD were calculated and 95% CI were used.

The independent paired samples paired t-test was used to analyses the significant value

Characteristics	Pre	Post
Weight (mean \pm SD)	66.57 \pm 11.141	65.925 \pm 11.075
Morning stiffness (mean \pm SD)	62.50 \pm 14.82	50.50 \pm 10.50
HAQ (VAS 0–100) mean \pm SD	69.75 \pm 11.29	56.50 \pm 12.15
Tender joint count (mean \pm SD)	18.45 \pm 6.71	15.75 \pm 5.08
Swollen joint count (mean \pm SD)	14.90 \pm 6.85	8.80 \pm 3.96
Sleep Disturbance (mean \pm SD)	63.50 \pm 15.99	49.50 \pm 11.80
Hemoglobin g% (mean \pm SD)	11.770 \pm 2.266	12.845 \pm 1.755
Blood Pressure High (mean \pm SD)	125.20 \pm 17.73	125.20 \pm 17.07
Blood Pressure Low (mean \pm SD)	80.90 \pm 7.99	86.65 \pm 6.31
ESR mm (mean \pm SD)	45.225 \pm 23.384	40.750 \pm 23.226
HAQ score, 0–3 scale (mean \pm SD)	1.216 \pm 0.4648	0.8495 \pm 0.3029
TNF- α pg/ml (mean \pm SD)	18.158 \pm 13.329	18.026 \pm 9.226
DAS28ESR (mean \pm SD)	6.888 \pm 1.004	6.2135 \pm 0.8905

DAS28, disease activity score in 28 joints; ESR, erythrocyte sedimentation rate; HAQ, health assessment questionnaire; VAS, visual analogue scale

Conclusion

The findings of the present study clearly show significant effect of practicing yoga on visual reaction time. The positive effect of practicing yoga is evident in the observed

significantly faster reaction time of yoga group as compared to those not practicing yoga. The observed faster reaction time of yoga of practitioners can be explained in terms of the effect of yoga on those aspects of human Personality and performance that can help to improve reaction time. For example, some researchers[62] found that yoga practitioners showed significant improvement in spatial and temporal measures and such enhanced spatial and temporal characteristics is likely to improve visual reaction time. The naturopathic treatment which is given to the patients is helpful in increasing blood circulation, stimulation of gastro intestinal part of the body and as well as removing the toxic substances from the body. Based on this analysis using several different approaches to evaluating potential definitions of improvement in RA, we suggest that improvement for clinical trial patients be defined as >60% improvement in tender & swollen joint counts in three month treatment. In addition the use of one single measure to evaluate the response to therapy in rheumatoid arthritis may be over all simple[63]. Massage generated heat with increased circulation in blood bringing down all the impurities to the channel and expelling through sweat or urine. The muscle and organs of abdominal area are fully activated due to the yogasanas with improved blood supply. Traditionally used technique like naturopathy improved metabolism of various organs of the body & yoga is helpful in strengthened the muscles & joints of the patients which further improved the life style of RA patients.

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