



EFFECT OF YOGIC EXERCISES ON SERUM CRP AND RF LEVELS OF RA PATIENTS IN URBAN PART OF MP

Biochemistry

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ABSTRACT

Introduction: Rheumatoid Arthritis (RA) is a chronic inflammatory auto immune disorder, where immune system attacks synovial lining of joints, resulting into, stiffness and dysfunction. In response to this the body releases CRP (C-Reactive Protein) in the bloodstream. **Aim:** Present study has been planned to see the effect of yogic exercises in order to subside the intensity of the RA symptoms and to determine the effects of yogic exercises on serum CRP and RF levels in RA patients. **Material and method:** Present study was carried out in MGM Medical College and Government Holkar Science College, Indore during December 2020-February 2022. Total 100 study subjects were taken out of which 50 were control and 50 RA cases. Fasting blood samples were collected from subjects and analyzed for CRP levels on fully automated biochemistry analyzer. Blood samples were also subjected for testing of RF. **Inclusion criteria:** Medically healthy people of 30-50 years of age and RA patients with 30-50 years of age. **Exclusion criteria:** RA patients with diabetes, CHD and other major complications. **Results:** Results reveal that;

- Increased level of CRP and RF has been observed in RA patients in comparison to healthy control.
- Significant decrease in levels of CRP and RF has been observed in RA patients with Yogic exercises as compared to RA patients without yogic exercises.

Conclusion: Yogic exercises brought down the CRP and RF levels and because of which complications and pain in RA patients can be reduced. Some yogic exercises should be practiced as an add on therapy in management of RA.

KEYWORDS

Yogic exercise, Rheumatoid arthritis, CRP, RF.

INTRODUCTION:

Rheumatoid Arthritis (RA) is a chronic inflammatory auto immune disorder, where immune system attacks synovial lining of joints, resulting into inflammation, stiffness and dysfunction⁽¹⁾. This bring about severe pain, lessen the joint mobility and causes fatigue. These symptoms significantly bring down the daily life activity. This painful chronic condition is not only the leading reason of deformities or disabilities but also impairs the quality of life⁽²⁾. Over the past decade, RA affects nearly 1% of the total population of the entire globe and has emerged as a major public health problem⁽³⁾. It has found more incidences in the age between 40–60 years and is more prevalent in females as compared to males and may affect any age group. In recent years, towards the treatment of RA a variety of non-pharmacologic strategies have been explored and they have been emerged as a budding method to relieve the symptoms of RA patients⁽⁴⁾. As an important non pharmacological treatment approach, yoga has gained ever growing attention in therapeutic treatment of RA⁽⁵⁾. Yoga is an ancient practice that arose in India around 5000 years ago and is having potential to improve health-related quality of life, including physical function, and inflammatory symptoms in RA patients⁽⁶⁾. Evans et al.⁽⁷⁾ reported that yoga lowered down the daily pain in RA patients, but in physical function no difference has been reported. Other studies conducted on RA patients described improvements in physical function⁽⁸⁾, disease activity⁽⁹⁾, grip strength⁽¹⁰⁾. In addition to Anti rheumatic drugs, Yogic exercises can be practiced to help in reducing the arthritic pain and stiffness of RA, so that patients can better cope up with the condition. CRP (C Reactive Protein) and RF (Rheumatoid factor) are the valuable markers of RA and levels of CRP and RF are found to be increased as the disease progresses.

C-reactive protein (CRP) is one of the most important acute-phase serum reactants produced by cells of the liver. It has been secreted in the bloodstream in response to the inflammation while RF (Rheumatoid factor) is the first antibody (protein) generated by immune system in order to attack its own healthy tissues in the body.

Present Study Has Been Planned In Order;

- 1) to determine the serum CRP and RF levels in the control group, RA patients (without yogic exercises) and RA patients (with yogic exercises).
- 2) to compare the serum CRP and RF levels in the control group and RA patients (without yogic exercises), and control group and RA patients (with yogic exercises), RA patients (without yogic exercises) and RA patients (with yogic exercises).

MATERIAL AND METHODS

The study was conducted from December 2020-February 2022 at MGM Medical College, Indore, MP and Government Holkar Science College, Indore, MP.

Inclusion Criteria For Cases:

1. Patients who were diagnosed with RA according to 2010 American college of Rheumatology (ACR)⁽¹¹⁾
2. Total 100 study subjects were taken out of which 50 were control and 50 RA cases.
3. Medically healthy people of 30-50 years of age as control group and RA patients with 30-50 years of age.

Exclusion Criteria For Cases:

- RA patients with diabetes, CHD and other major complications.
- Participants were kept on routine disease-modifying anti-rheumatic drugs (standard therapy) and yoga. Patients suffering with RA were suggested to do yogic exercises under the supervision of licensed practitioner with a Master's degree in Yoga for about 45 mins to one hour per day at least for 5 days a week, for a total of 6 weeks.
 - Fasting blood samples were collected from subjects and analyzed for CRP and RF levels on fully automated biochemistry analyzer.

Statistical Analysis:

Statistical analysis was conducted using SPSS. Data were represented as Mean $\pm$ SD. Comparison were analyzed by student t test and p value. The levels of CRP and RF were taken before and after the study period.

OBSERVATION AND RESULT:

Table 1: Comparative study of Serum levels of CRP and RF in the Control group and Cases (Without Yogic exercises)

S.N.	Parameter	Control Mean & $\pm$ SD n = 50	Cases (Without yogic exercise) Mean & $\pm$ SD n = 28	p value
1.	CRP (mg/dL)	0.9 $\pm$ 0.01	19.8 $\pm$ 3.1	< 0.005
2.	RF (IU/ml)	13.2 $\pm$ 2.8	65.5 $\pm$ 8.2	< 0.005

Table 2: Comparative study of Serum levels of CRP and RF in the Control group and Cases (With Yogic exercises)

S.N.	Parameter	Control Mean & $\pm$ SD n = 50	Cases (With yogic exercise) Mean & $\pm$ SD n = 22	p value
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1.	CRP (mg/dL)	0.9 ± 0.01	14.8 ± 1.6	< 0.005
2.	RF (IU/ml)	13.2 ± 2.8	48.3 ± 9.8	< 0.005

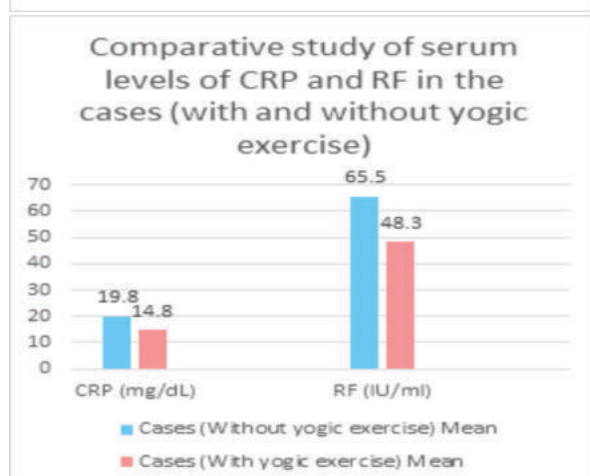
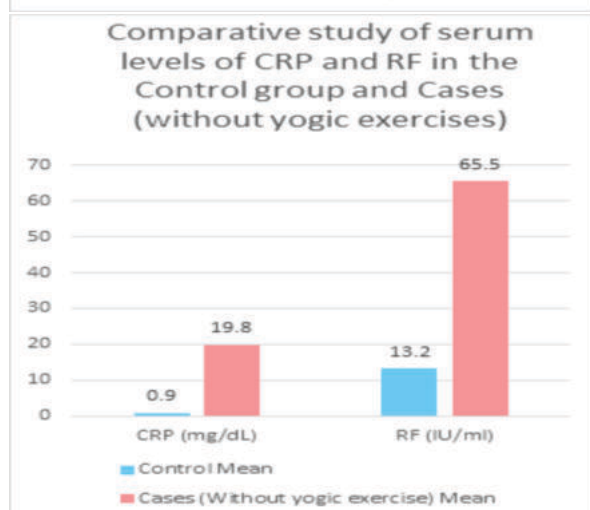
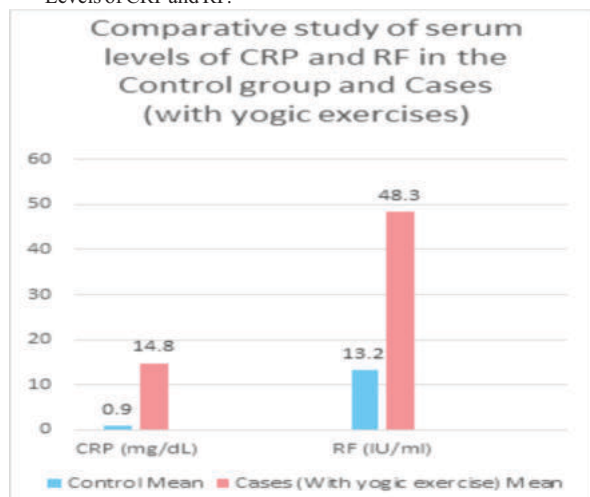
Table 3: Comparative study of Serum levels of CRP and RF in the Cases (Without Yogic exercises) and Cases (With Yogic exercises)

S. N.	Parameter	Cases (Without yogic exercise) Mean & ± SD n = 28	Cases (With yogic exercise) Mean & ± SD n = 22	p value
1.	CRP (mg/dL)	19.8 ± 3.1	14.8 ± 1.6	< 0.005
2.	RF (IU/ml)	65.5 ± 8.2	48.3 ± 9.8	< 0.005

Outcomes:

The major outcomes included;

- Pain
- Overall improvement in physical activity of patients
- Levels of CRP and RF.



Results Reveal That;

1. Yogic exercises along with medical therapy helps RA patients to better cope up with the disease as practicing yogic exercises not only reduces the arthritic pain and but also bring down the stiffness of RA.
2. Yogic exercise in RA patients has been reported highly beneficial as it enhances physical function, grip strength and disease activity in RA patients.
3. Significant increased levels of CRP and RF has been observed in RA patients in comparison to healthy control.
4. Significant decrease in levels of CRP has been observed in RA patients with Yogic exercises as compared to RA patients without yogic exercises.

DISCUSSION:

To the best of our knowledge, this is the first review to evaluate the levels of CRP and RF in RA patients pre and post study period. It also helped to evaluate the effectiveness of yogic exercises in order to reduce pain in RA patients. Although the cause of RA is not known and it is incurable, to control symptoms, to prevent joint damage, and to manage physical function for improving the RA patient's quality of life is the main aim of treatment now days⁽¹¹⁾. And managing inflammation is key to optimal therapeutic success⁽¹²⁾. Non-pharmacological interventions are reported beneficial for RA, and as the American College of Rheumatology (ACR) emphasized that stretching, strengthening, and conditioning exercises may manage the physical function⁽¹³⁾.

Years ago few reviews have examined the effect of yogic exercises on Rheumatic conditions and the authors concluded that yoga can be useful as an add-on therapy for treating RA and most significant benefits of yogic exercises were reported when it has been practiced in a combination of stretches and asanas, strengthening, respiratory exercises and meditation⁽¹⁴⁾.

Yoga is believed to improve physical and mental health, including physical function and depressive symptoms, pain, and fatigue, and sleep of the people with RA, by including meditative breathing with physical exercises⁽¹⁵⁾. Yoga highlighted the regular practice of breathing and relaxation exercises as well as meditation to lessen chronic pain symptoms. These exercises may help to break the pressure-pain cycle to relieve chronic pain symptoms by stimulating the parasympathetic nervous system^(16, 17). Additionally, for maintaining the physical function of RA, the effect of yogic exercises on the musculoskeletal system may be significant.

When it comes to observe the changes in Biochemical parameters in RA patients, an observable change in RF levels has been found. The immune system of the patients with autoimmune disorders mistakenly attack on healthy cells for foreign bodies and subsequently creates higher RF levels. It has been observed that C-reactive protein levels also elevate dramatically in response to injury, infection, and inflammation.

There are many factors including age, gender which are responsible for elevating the levels of CRP. CRP is the important downstream mediator of the acute-phase response which is followed by an inflammatory event and is primarily synthesized by IL-6-dependent hepatic biosynthesis^(18, 19). The main role of CRP in inflammation emphasize around the activation of the C1q molecule in the complement pathway leading to the opsonization. Although CRP initiate the host defense by activating the complement pathway but is also responsible for initiating cell-mediated pathways by activating complement as well as to binding to Fc receptors of IgG⁽¹⁸⁾.

Till now no study has been carried out to measure the CRP and RF levels after patients were suggested to follow yogic exercises.

The present study helped us to evaluate the effect of yogic exercises in the RA patients. Yoga has been found to effectively and significantly improve fatigue and associated pain in RA patients. Fatigue and pain is very common in RA patients and Yogic exercises has been found to significantly reduce the alleviation of fatigue and pain in RA patients.

CRP and RF which are valuable markers for RA; their significantly reduced levels have been reported in RA patients practicing yogic exercises on daily basis which also suggest the importance of Yoga practice in the management of RA.

Limitation Of Study:

- There was a small number of patients included.
- Yoga users were generally female so less participation of male patients.
- Duration of the disease in patients were not taken into consideration.

CONCLUSION:

Yogic exercises are one of the prominent self-management strategy for RA patients to lessen the physical symptoms and managing the painful chronic condition. RA patients who are suffering with pain, inflammation, limited mobility and greater CRP and RF levels with the continuous practice of Yogic exercises on daily basis can carry on their daily activities with reduced pain, considerable mobility and reduced CRP and RF level as compared to RA patients who do not practice yogic exercises.

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