ORIGINAL ARTICLE

# Dietary beliefs of patients with rheumatoid arthritis: Which food items do they think worsen their disease?

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**Abstract**

**Introduction**

Dietary factors have been linked to the development of rheumatoid arthritis (RA) and efforts have been made to mitigate its inflammatory burden through dietary manipulations.

**Methods**

The cross-sectional, descriptive study conducted at a tertiary care referral hospital in Bengaluru, India, evaluated the dietary habits of participants using a structured questionnaire administered by a nutritionist in the outpatient department.

**Results**

The study included 100 patients (91 women) with a mean age of 46.95 (± 10.65) years and a mean illness duration of 60 (±71.41) months. The BMI categories showed 16 individuals classified as overweight, and 40 in the type 1 obese category. Forty-four patients believed that articular symptoms were influenced by their diet. Among the perceived trigger foods, roots and tubers were reported by 25 patients, while legumes, poultry, and egg products were mentioned by a smaller number of patients. Almost half of the selected patients had self-experimented with their diet to reduce articular symptoms, primarily with food items such as potatoes, tubers, poultry, and eggs.

**Conclusion**

Patients with RA frequently self-experiment with diet modification, specifically targeting tubers and poultry in an attempt to reduce articular symptoms. Taking cue from this, structured diet elimination could be considered in the future.

Keywords: Rheumatoid Arthritis, Inflammatory foods, Body Mass Index

## Introduction

Several environmental factors including dietary factors have been implicated in the pathogenesis of rheumatoid arthritis (RA). While there is no known cure for RA, dietary modifications and lifestyle alterations in conjunction with pharmacotherapy can help alleviate symptoms and improve quality of life. Since the 1930s, researchers have explored the link between diet and arthritis.[1] Several investigators have attempted dietary manipulations such as fasting, and adopting a vegan diet , in an effort to reduce the inflammatory burden of RA.[2,3]

Based on current scientific evidence, efforts have been made to develop nutritional recommendations for RA patients. The European League Against Rheumatism (EULAR) recommends a healthy balanced diet.[4] The French Society for Rheumatology has formulated nutritional recommendations for RA patients, emphasizing the importance of a healthy diet as one component of overall care. They recommend Mediterranean diet and supplementation with polyunsaturated fatty acids; however, this may not be universally acceptable to patients from different ethnicities and geographic regions.[5]

Patients across the world hold divergent perceptions about food items particularly in the context of arthritis.

Indian patients typically consider several food items as 'ones creating heat' or causing inflammation. They tend to experiment by removing one or more dietary contents and self-observe the impact on their RA disease status. Furthermore, India being a land of Ayurveda and vegetarianism, diet is believed to be the strongest contender for origin of arthritis. The present study was intended to understand patient perceptions regarding the influence of diet on their disease symptoms.

## Methods

The cross-sectional, descriptive study was conducted at the outpatient department of at a tertiary care referral hospital located in Bengaluru, Karnataka, India. The study included consecutive RA patients on the disease-modifying anti-rheumatic treatment for more than 1 year of illness, irrespective of their disease activity. Subjects with other autoimmune rheumatic diseases (AIRDs) and overlap syndromes were excluded. Their dietary habits were captured using a structured questionnaire, which was administered by a nutritionist. Specifically, their beliefs regarding inflammatory dietary items and self-modifications of their diet were recorded. Other data captured included socio-demographic profile, disease-related parameters and comorbidities. Relevant anthropometric measurements were recorded, and the body mass index (BMI) was calculated as per the Asian BMI classification.[6] Written informed consent was obtained from all study participants and the study was approved by the Institutional Ethics Committee (St. John's Medical College, IEC No. 82/2021, dated 15 April 2021).

## Statistics

Descriptive data was reported as mean, numbers, and percentages for the categorical variables as appropriate.

## Results

The study included 100 patients (91 women) with a mean age of 46.95 (+10.65) years and mean duration of illness of 60 (+71.41) months. More than half of the patients belonged to Karnataka, and the remaining subjects from neighboring states. About one-third of patients had a normal BMI, 16 were overweight and another 40 patients were in the type 1 obese category. The anthropometric and sociodemographic data are represented in table 1.

Eighty patients were non-vegetarians, while the rest were lacto-vegetarians. However, most non-vegetarians consume poultry items only once or twice a week and none consume seafood. The influence of diet on the articular symptoms was noted by 44 patients, while 42 patients did not hold this belief. Fourteen patients did not offer any opinion regarding the influence of diet on their articular symptoms. The selected patients with RA believed that roots and tubers (25) were the cause of their flare-ups, while others reported legumes (15), poultry (12), egg, and egg products (19) (Table 1). Nearly half of the study population (n=46) removed those perceived as offending food items from their respective diet to reduce their symptoms. None of the patients specifically used any supplementation dietary ingredients to improve their articular symptoms.

## Discussion

The current study reported the perceptions of the patients with RA from South India about the role of diet in their disease manifestations. The patient population largely belonged to the lower and middle class and comprised a mix of patients from the state of Karnataka and neighboring states.

Diet exerts a significant impact on body composition and BMI, indirectly influencing the onset and progression of RA.[1] Several studies have shown that abdominal obesity is associated with higher RA risk, and may contribute to disease activity and joint damage.[7-9] In the present study, around 40 patients belonged to the category of type 1 obesity. This underscores the significance of incorporating multidisciplinary care, involving nutritionists and lifestyle interventions, as crucial components of patients' treatment plan.

Conventionally, several food items are potential triggers of the immune system, leading to inflammation by the activation of macrophage and other effector cells.[10] Therefore, nearly half of the study population (n=46) had attempted to remove certain food items from their diet in an effort to reduce their symptoms as per their judgment.

Several nutrients, such as polyunsaturated fatty acids, are reported to have anti-inflammatory and antioxidant properties, thereby believed to have a protective role against RA development.[10] These studies have primarily focused on the development of RA rather than flares or disease activity, and they have not demonstrated long-term benefits. In a systematic review, involving eight randomized controlled trials with a total of 366 patients, the authors could not substantiate the effects of various dietary manipulations such as vegetarianism, switch to Mediterranean diet, elemental eating plans, and elimination diets on rheumatoid

**Table 1: Baseline demographics and anthropometric parameters and patients' perceptions regarding inflammatory food items (n=100)**

| Baseline demographic and anthropometric parameters | n | Perception of 'inflammatory' food items | n |
|---|---|---|---|
| **Language spoken** | | Roots and tubers | 25 |
| Kannada | 31 | Grain legumes | 15 |
| Telugu | 20 | Poultry | 12 |
| Tamil | 6 | Other vegetables | 11 |
| Hindi | 13 | Animal meat | 10 |
| **Socioeconomic class** | | Green leafy | |
| Upper lower class | 31 | vegetables | 6 |
| Lower class | 27 | Fruits | 5 |
| Upper middle class | 23 | Nuts and oil seeds | 4 |
| Lower middle class | 19 | Cereals and millets | 3 |
| **Comorbidity** | | Sugars | 3 |
| Diabetic mellitus | 13 | Milk & milk products | 6 |
| Hypertension | 6 | Egg and egg products | 7 |
| Hypothyroidism | 12 | Miscellaneous foods | 4 |
| **Anthropometry** | | | |
| BMI | | | |
| Underweight ≤18.5 | 7 | | |
| Normal weight = 18.5–22.9 | 34 | | |
| Overweight = 23–24.9 | 16 | | |
| Obesity type 1= 25-40 | 42 | | |
| Obesity type 2 = 40.1-50 | 1 | | |
| Waist-hip ratio (mean) | 0.911 | | |

arthritis.[11] The French Society recommends that patients with RA seeking greater control over the impact of their diet on their condition should focus on consuming omega-3 fatty acids and adopting a Mediterranean diet, as well as supplementing with polyunsaturated fatty acids. However, the feasibility of implementing these recommendations in the Indian population, considering factors like convenience and requirement of fasting, seems challenging.[10]

Diet containing red meat and salt is reported to have a negative impact on RA.[1,12] It is advised that red meat intake should be limited (1-2/month), extra-virgin olive oil should be consumed daily, along with fatty fish 1–2 times /week, and other types of fish and poultry weekly.[1,10] However, the Indian diet typically does not include the use of olive oil, and none of the current patients were regularly consuming fish or red meat.

Cereals and millets were reported by current study patients as potential triggers for RA symptoms, possibly due to their gluten content. Although gluten sensitivity is a widely believed concept in the West, only a few of the current patients reported wheat as an offending factor. A randomized controlled trial found gluten-free vegan diet was suggested to be atheroprotective and anti-inflammatory.[13]

In the present study, patients who consumed potatoes and other tubers attributed them to be responsible for worsening articular symptoms. Potatoes, belonging to the *Solanaceae* family, are rich in p-coumaric acid and have been shown to significantly reduce the expression of TNF-α in adjuvant-induced arthritis models. However, the present study subjects reported contrary findings.[14]

Considering the significant regional and geographic differences in the prevalent dietary practices, understanding the patient's perspectives becomes imperative. Dietary interventions are likely to be unsuccessful if they are beyond the prevalent practices and concepts. Region-specific dietary interventions are more appealing to both patients

as well as clinicians, as they are affordable and accessible. In the present study, 80 patients were non-vegetarian, and the remaining were lactovegetarian. This suggests that a completely vegan diet, often recommended for its potential benefits in RA patients, may be difficult to implement in this population. Moreover, the traditional Indian diet rich in spices such as turmeric and ginger has been shown to reduce the inflammatory cytokines such as IL1 and IL6. Therefore altering the diet structure may not be beneficial in the present context.[15]

The study encompassed a thorough examination of the inflammatory response by considering a diverse array of food groups, including cereals and millets, grain legumes, green leafy vegetables, other vegetables, fruits, roots and tubers, condiments and spices, nuts and oil seeds, sugars, mushrooms, miscellaneous foods, milk and milk products, egg and egg products, poultry, animal meat, seafoods, and edible oils and fats.

The cross-sectional study, conducted at a single center, yields valuable insights into the relationship between dietary practices and RA. The inclusion of patients with an extended duration of the disease allowed for self-experimentation with their diet, enhancing the study's internal validity. The meticulous recording of self-help measures through dietary intervention in real-life settings by a trained nutritionist further strengthens the study.

However, it is important to acknowledge the study's limitations. The generalizability of the results is limited by the single-center design and cross-sectional nature, which hinders the establishment of causal relationships. The use of a random convenient sampling method may not fully represent the entire population with RA. Additionally, the study did not capture details about the medical treatment of patients or identify those managing RA exclusively through diet. Relying solely on patients' beliefs and self-observation of pain-inducing food consumption for gathering information on food elimination poses a potential source of bias. Future research should specifically investigate the effects of eliminating specific foods. It is also essential to study the impact of practicing lifelong elimination of certain foods, including its applicability to all forms of processed foods.

## Conclusion

The study sheds light on the perspectives of RA patients in South India regarding the influence of diet on their disease manifestations. Nearly half of the patients took proactive measures by self-experimenting with their diets to alleviate articular symptoms, focusing primarily on food items like potatoes, tubers, poultry, and eggs. These findings emphasize the significant role that patient-driven dietary adjustments play in the management of RA.


### Competing interests

The authors declare that they have no competing interests.

### Citation

V Shaleni, Salim MH, J Ramya, Shobha V. Dietary beliefs of patients with rheumatoid arthritis: Which food items do they think worsen their disease? IJRCI. 2023;11(1):OA1.

**Submitted:** 21 September 2023**, Accepted:** 17 January 2024, **Published:** 18 January 2024

DOI: 10.15305/ijrci/v11i1/380



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