

## Role of Diet in the Disease Activity of Arthritis: A Questionnaire Based Survey

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**Abstract:** Very few studies have been conducted regarding the role of diet in the disease activity in joint disorders. None of such studies have been conducted so far in this direction in Asian countries in general and in India in particular. The objective of the study was to see the influence of the diet and fasting on the disease activity in musculoskeletal disorders. The possible influence of diet on chronic arthritis is difficult and controversial issue. A number of epidemiological studies have examined the role of diet in the aetiology of rheumatoid arthritis. Many patients with arthritis believe that diet has an influence on disease activity and report the aggravation of symptoms associated with certain diets. The study was a questionnaire based survey of the patients with joint disorders who attended the Out Patients Department of Regional Research Institute of Unani Medicine, Srinagar Kashmir India. The survey was conducted on 100 patients consisting of 85% osteoarthritis patients and 15% rheumatoid arthritis patients. The 80% of rheumatoid arthritis patients believed that diet has some role in disease activity and 53% of osteoarthritis patients believed the aggravation of symptoms with certain diets. On the whole red meat was found to be major constituent of diet which aggravated the symptoms in 80% of rheumatoid arthritis patients and 41.1% osteoarthritis patients. Influence of fasting during the month of Ramadan was also recorded and it was observed that 61% of rheumatoid arthritis patients had relief during fast while as 49.3% of osteoarthritis patients had relief in symptoms during the fasting. The details are discussed in the paper. It is concluded that certain diets have definite role to play on the disease activity in joint disorders and fasting has some effect on the severity of the disease.

**Key words:** Red meat, Rheumatoid Arthritis, osteoarthritis, fasting, Ramadan

### Introduction

The possible influence of diet on chronic arthritis is a difficult and controversial issue. The patients suffering from different types of arthritis always pose a question to the clinician that which type of diet is to be avoided and which food is to be taken. The physicians of the past like Avicenna, Rhazis etc have given clear cut advice on diet regimen along with the treatment for the arthritis patients [Zakariya Razi (1994) 935AD, Abu Ali Ibni Sena (1993) 980-1037 AD]. The patients had been advised to avoid red meat and citrus foods, take lot of fish and white meat. It is now that the scientists after lot of studies have come to the conclusion that red meat has some adverse effect on the symptoms of the arthritis patients (Dorothy *et al.*, 2004). Different studies have been conducted from time to time so to evaluate the effect of diet on the disease activity. In a study conducted in Italy showed significant clinical improvement by dietary treatment (Sarzi-Puttini *et al.*, 2000). In another study conducted at All India Institute of Medical Sciences, New Delhi showed 71% (n = 10) of the patients suffering from Rheumatoid Arthritis had significant clinical improvement with diet therapy (Beri *et al.*, 1998).

A number of epidemiological studies have examined the role of diet in the aetiology of rheumatoid arthritis. In such a study conducted in Norway on arthritis patients

(n = 20), the effect of elemental diet was observed and it was found that out of 10 patients from experimental group 3 patients improved subjectively as well as objectively. Although the sample size being the small. Darlington *et al.* in their study have proved that the patients with Rheumatoid Arthritis not previously aware of having food intolerance, benefited with elimination of certain diets (Darlington *et al.*, 1986).

Many patients with arthritis believe that diet has an influence on disease activity and report the aggravation of symptoms associated with certain diets. As no such study has been so far conducted in India in general and in the Valley of Kashmir in particular so this study was taken up to shed some light on whether there is any relation between diet and the disease activity in different types of arthritis.

### Materials and Methods

This study was a questionnaire based survey conducted in the general OPD of Regional Research Institute of Unani Medicine, Srinagar, Kashmir, working under the aegis of Central Council for Research in Unani Medicine, New Delhi during 2006-2007. Although the patients with different types of arthritis do visit the OPD of the Institute but only the patients with Rheumatoid Arthritis and Osteoarthritis were surveyed.

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Table 1: Characteristics of the patients participating in questionnaire based survey

Diagnosis	No. of Patients	Sex		Age (Mean±SD)	Duration (Mean±SD)
		Male	Female		
Rheumatoid Arthritis	15	0	15	39±10.5	53±51.02
Osteoarthritis	85	11	74	48.6±9.4	32.7±24.8

Mean age of the patients being 39±10.5 years in Rheumatoid Arthritis (RA) and 48.6±9.4 years in Osteoarthritis (OA) and the duration of the disease in RA was 53±51.02 months and that of OA was 32.7±24.8 months

Table 2: Anthropometric data of 100 patients surveyed

Anthropometry	Weight(Kg)		Height(cm)		BMI	
	Male	Female	Male	Female	Male	Female
Mean	64.80	63.32	160.47	152.48	25.24	27.41
Standard deviation (SD)	6.87	10.88	7.54	9.91	2.81	5.17
Standard Error of Mean (SEM)	2.17	1.23	2.38	1.12	0.59	0.58
Minimum	57	40	150	120	20.2	17.3
Maximum	75	87	170	182	28.5	47.1

The mean BMI of male patients was 25.24±2.81 and in females it was 27.41±5.17

The questionnaire used by M Haugen during their study in Norway was utilized with certain necessary modifications so to suit local population (Haugen *et al.*, 1991). The questionnaire is available from the principal author on request.

The questionnaire consisted of 12 major questions with variety of sub-questions. Apart from the anthropometric data the patients were asked how great influence in general they believe the diet had on the disease symptoms which was measured on numerical scale rating from 0 to 10, where 0 stands for nil and 10 is for extreme. The patients were then asked if they had experienced aggravation of symptoms with food intake and if the answer was yes then they were asked to name the food item. As the valley of Kashmir is inhabited by 99% Muslim population so almost every body observes fast for one month every year in the holy month of Ramazan, so the influence of the fast was recorded on the questionnaire. The patients were also asked if they had avoided any particular diet and how long they observed the diet therapy and what was its influence on the disease activity.

The survey was conducted on 100 patients. The questioning took almost 10 to 20 minutes.

**Statistics:** The data thus collected was calculated with cross tabulation on hp personal computer using Instat-3 programme for statistical calculations. Mean, Standard Deviation (SD), Standard Error of Mean (SEM), maximum and minimum were calculated for age, duration, weight, height, Body Mass Index (BMI), influence of diet on disease and influence of fasting on the disease activity.

### Results

The total 100 patients were surveyed during 2006-2007. During the study it was found that 12 (12%) patients were male and 88 (88%) patients were female. Among

the surveyed patients 15 patients were having Rheumatoid Arthritis and 85 patients were having Osteoarthritis (Table 1).

All the patients having Rheumatoid Arthritis (RA) were female and out of 85 osteoarthritis patients (OA) 11 (12.9%) were male and 74 (87.1%) were female. The mean age of the patients was 47±18.0 with mean age of RA patients being 39±10.5 and that of OA patients being 48.6±9.4. The minimum age in RA was 25 years and that of OA also was 25 years, so it is pertinent to mention here that the OA is not the disease of above 40 years age as the people of the younger age also suffer from the disease. The duration of the disease in case of RA ranged from 8 months to 180 months with mean duration 53.0±51.0 and the duration of the disease in OA ranged from 3 months to 120 months with mean duration of 32.7±24.8.

From the data in Table 2 it is evident that the mean weight in males was 64.80±6.87 Kg and in females it was 63.32±10.88 Kg. The mean height of male was 160.47±7.54 cm and that in females it was 152.48±9.91 cm. The mean BMI in male was 25.24±2.81 and that in female it was 27.41±5.17.

**Influence of food on disease symptoms:** The patients were defined as “non believers” who told that the food has no effect on the disease symptoms and marked “0” on numerical analog scale. Those patients who marked 1 to 4 on the scale were defined as “poor believers” and the patients who marked 5 to 10 were defined as “good believers”. Out of 100 patients surveyed 43% patients believed that diet had no effect on the disease activity while as 57% patients believed that diet has some role to play in the disease activity.

Among the RA patients the 80% patients believed that the diet has a role in the disease activity of which 60% were good believers and 20% were poor believers. In OA

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Table 3: Influence of diet on disease

Rating on numerical scale	Rheumatoid	
	arthritis	Osteoarthritis
Non believers (0)	3	40
Poor believers (1-4)	3	21
Good believers (5-10)	9	24
Total	15	85

Maximum number of patients believed that diet has some influence on the disease activity

Table 4: Influence of fasting on the disease symptoms

Disease	No. of patients fasted	Relief in symptoms	
		Relief in symptoms	No relief
Rheumatoid Arthritis	13 (86.6%)	8 (61.5%)	5 (38.4%)
Osteoarthritis	75 (88.2%)	37 (49.3%)	35 (46.6%)

Fasting has definite influence on the disease activity as evident from the data as 61.5% of patients from RA had relief in the symptoms while as 49.3% of OA patients had relief during fasting

53% of the patients were either good or poor believers while as 47% patients were non believers. In a similar study conducted in Norway only 36% of RA patients reported aggravation of symptoms with certain foods while as 26% of OA patients believed the food having influence on disease activity (Haugen *et al.*, 1991). In our study meat was the major constituent of diet which aggravated the symptoms in RA as 80% of the patients reported the aggravation of symptoms with meat. However pulses and green leafy vegetables were also reported to have adverse effects on the disease activity. The patients suffering from OA also reported aggravation of symptoms with different food stuffs, 41.1% reported meat and 18% of the OA patients believed pulses have influence on the disease activity. Meat was reported to have caused aggravation of symptoms in 50% of patients in the study conducted by M Haugen in Norway. From the present survey almost any food item could cause aggravation of disease symptoms.

**Influence of fast on disease symptoms:** Since the survey was conducted in Muslim dominated area, so it is obligatory on the Muslims to observe fast in the Holy month of Ramazan. From the data obtained 88% of the patients were found observing the fast for more than 20 days. Muslims abstain from eating and drinking during the day from sunrise to sunset. The duration of the fast varies from 11 hours to 16 hours depending on the season when the month of Ramazan occurs. During the winter season as the days are shorter so the duration of fast is approximately 11 hours and during the summers when the days are longer the duration of fast reaches to 16 hours approximately.

Although there is no change in diet during the Holy month of Ramazan but the long duration of fasting helps in the regression of disease symptoms to some extent. In this study 86.6% of RA patients and 88.2% of OA patients observed the fast. Sixty one percent of RA patients observed relief during the fast which lasted for

almost for another one month while as 38.4% patients had no relief (Table 4). Haugen *et al.* have also reported 61% of RA patients having relief in their study (Haugen *et al.*, 1991). In case of OA 49.3% patients had relief in major symptoms (pain, swelling, range of motion etc), 46.6% of patients had no relief while as 4.0% of patients were having aggravation of symptoms.

## Discussion

The aim of present study was to see 1) the number of patients suffering from different types of arthritis who experience aggravation of symptoms after food intake 2) to register the possible influence of fasting on the disease activity.

In 80% of RA patients who believed that the diet has some influence on the disease activity meat was the major constituent of the diet that was believed to aggravate the disease activity, 69% RA patients believed pulses do aggravate the symptoms. The aggravation of symptoms with meat agrees with the studies conducted earlier where the fact was established that red meat aggravates the symptoms in RA (Dorothy *et al.*, 2004; Grant, 2000). Although the data are fairly limited but the occurrence of RA is lower in Mediterranean countries, where the level of consumption of red meat is typically lower than that of most Western countries (Skoldstam *et al.*, 2003; Kjeldsen-Kragh *et al.*, 1991). Red meat is a rich source of iron, which has been known to accumulate in rheumatoid synovial membrane causing tissue damage (Blake *et al.*, 1981).

In our study 41.1% OA patients reported meat to be major food item which aggravates the symptoms of pain and swelling. Since meat gives rise to free radicals due to iron-catalyzed oxidative reaction and have been shown to exacerbate the synovial inflammation (Blake *et al.*, 1985). Although during the survey almost every food item was reported to aggravate the symptoms in RA as well as OA, but the number of patients was insignificant. Van de Laar in his study has reported the existence of food intolerance in minority of RA patients (Van de Laar, 1992). Very few studies regarding diet and osteoarthritis (OA) have been conducted so far where the role of Reactive Oxygen Species (ROS) and oxidants has been established. The high intake of dietary vitamin C reduces the risk of developing knee pain and reduced risk of OA progression was seen for beta carotene (McAlindon *et al.*, 1996).

In our study it was found that fasting has major impact on RA as compared to OA as 61.1% of RA patients reported relief in major symptoms during fast while as only 49.3% of OA patients reported such effect. Aggravation in symptoms of OA was also reported by some patients (4%) but that was statistically insignificant.

Fasting in RA has been extensively studied by various scientists and the effect has been evaluated statistically

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and found to be very much helpful in reducing the symptoms (Skoldstam, 1979). In our study although the patients had fasted for the longer duration as compared to the previous studies by various scientists i.e. more than 20 days as against the 7 days fasting (Kjeldsen-Kragh *et al.*, 1991). In their study they have found that most of the patients with RA benefited with short term fasting but the symptoms recurred following the reintroduction of food and they have also found that the improvement can be sustained by individually adjusted vegetarian diet. In our study 61.5% of RA patients out of 86.6% who observed fast got relief in the symptoms but the symptoms recurred when the normal diet was reintroduced by them thus agreeing with the earlier studies. There has been no such study conducted in osteoarthritis and the effect of fasting has not been evaluated so far. In our study we have found 49.3% osteoarthritis patients got relief with fasting during Ramazan. It has been reported by various researchers that during Ramazan fasting there is increase in certain blood constituents. In one such study increase in high-density-lipoprotein cholesterol was reported (Maximo *et al.*, 1993), also decrease in body weight has been reported (Suliaman *et al.*, 1982) which can be responsible for the relief in the symptoms of OA, increased fat oxidation has been reported during Ramazan which can also be held responsible for the decrease in disease activity (Jalila *et al.*, 1995). Thus from this study it can be concluded that 1) the diet therapy is one of the cheapest alternatives to conventional NSAID's for the management of arthritis 2) fasting can be considered for the management of joint disorders along with the diet manipulation.

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