



Research Article

ASSESSMENT OF DISEASE SEVERITY IN RHEUMATOID ARTHRITIS SUBJECTS OF
DIFFERENT *PRAKRITI*

Bandana Sharma^{1*}, Shilpa Dogra², Vividha Mahant³

¹Assistant Professor, PG Department of Kriya Sharira, ²Assistant Professor, Department of Rachana Sharira, ³Assistant Professor, PG Department of Ayurveda Samhita & Siddhant, Shiva Ayurvedic Medical College and Hospital, Himachal Pradesh, India.

Article info

Article History:

Received: 23-04-2026

Accepted: 28-05-2026

Published: 07-06-2026

KEYWORDS:

Rheumatoid
Arthritis, *Agni*,
Koshtha, *Prakriti*.

ABSTRACT

The concept of *Prakriti* -individual temperament is fundamental in the practice of Ayurveda making it one of the earliest documented concepts of P4-Predictive, Participatory, Preventive and Personalized medicine. The following article is a cross-sectional study to assess prevalence of different and severity of disease in individuals suffering from Rheumatoid Arthritis. We have included various parameters such as gender, age group, *Agni*, *Koshtha* etc to validate the existing concept of Ayurveda as well as modern science facts. SPSS 17.0 software was used to assess the observations and statistical analysis was done accordingly. We decided on 5% level of significance to conclude any association. Since our observations were qualitative, we used Chi-Square test to test association. We observed that, P-Value was less than 0.05. Hence, we conclude that, there is significant difference between *Prakriti* and RA Score and Disease Activity Score (DAS 28). Ayurveda has individualistic approach towards every subject; giving us an edge in making personalized prognosis and treatment protocol. With the present study we concluded that by assessing *Prakriti*; disease outcome and severity of rheumatoid arthritis can be predicted and preventive measures could be taken if prevalence of RA is studied in different constitution subjects.

INTRODUCTION

Prakriti (constitution) is conductive state of *Dosha*, formed at the time of formation and development of *Garbha* (fetus) due to self-excitatory causes and which runs from birth to death^[1]. At the time of union of sperm and ovum, predominance of *Dosha* (humour) decides the constitution of every individual^[2]. According to the permutation and combination of different *Doshas* in different stages, *Prakriti* of an individual varies viz. *Vataj*, *Pittaj*, *Kaphaj*, *Vata-Pittaj*, *Pitta-Kaphaj*, *Vata-Kaphaj* and *Vata-Pitta-Kaphaj*^[3]. Predominance of single, dual or all of the *Dosha*, in various proportions, affects fetus. Manifestation of such preponderance is *Dehik Prakriti* of an individual. A persons *Prakriti* has two aspects i.e., genetic and acquired.

The genetic aspect depends upon sperm and ovum. While the acquired traits develop in relation to environmental factors such as climate, season, time factor, age, race, familial inheritance. *Prakriti* has been one of the most relevant basic constructs of Ayurvedic health care science. It fundamentally explains the biological specificity operating at cellular and genomic level and is held largely responsible for distinctions among individuals observed functionally and morphologically^[4].

From the very time of conception, some persons are having equilibrium of *Vata*, *Pitta* and *Kapha* while others are seen *Vatala*, *Pittala* and *Slesmala* (having predominance of *Vata* or *Pitta* or *kapha*) dominance. Amongst them, those of the first category (equilibrium of *Vata*, *Pitta* and *Kapha*) are not susceptible to diseases, while others (having predominance of *Vata* or *Pitta* or *Kapha*) are always susceptible to certain ailments^[5]. Individuals of similar body constitution (*Dehika Prakriti*) are prone to certain types of diseases^[6]. By evaluating the *Prakriti* of subjects suffering from similar disease; we can

Access this article online

Quick Response Code



<https://doi.org/10.47070/ijapr.v14i6.4184>

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assess the course and outcome of the treatment. If the constitution is known then the *Aushadh vyavastha*, *Ahar-Vihar* and other regime can be prescribed accordingly for treatment purpose as well to maintain endurance. One such debilitating disease which is a huge burden on mankind both for individual well-being and society is rheumatoid arthritis. Rheumatoid arthritis is a chronic multisystem disease with a prevalence of ~0.8% (ranging from 0.3%-2.1%) worldwide. There is 0.5% to 0.75% prevalence of the disease in India. The onset of disease is frequent during 4th and 5th decade of life with 80% of patient developing the disease between 35 to 50 years of age^[7].

Rheumatoid arthritis (RA) is a chronic inflammatory disease of unknown aetiology marked by a symmetric, peripheral polyarthritis. Rheumatoid arthritis being a systemic disorder results in a variety of extra articular manifestations like fatigue, subcutaneous nodule, lung involvement, pericarditis, peripheral neuropathy, vasculitis and hematologic abnormalities. Serum antibodies to cyclic citrullinated peptides (anti-CCPs) are routinely used along with rheumatoid factor as a biomarker of diagnostic and prognostic significance^[8]. RA is a systemic connective tissue disorder which affects predominantly the synovial joints. Hence the term 'Rheumatoid Arthritis'^[9]. It is quite evident from studies over the years that genetic factors contribute to the occurrence of RA as well as to its severity. The likelihood that a first-degree relative of a patient will share the diagnosis of RA is 2-10 times greater than in the general population^[10]. In 2010, a collaborative effort between the American College of Rheumatology (ACR) and the European League against Rheumatism (EULAR) revised the 1987 ACR classification criteria for RA in an effort to improve early diagnosis with the goal of identifying patients who would benefit from early introduction of disease modifying therapy. Application of the newly revised criteria yields a score of 0-10, with a score of ≥ 6 fulfilling the requirements for definite RA. The new criteria include a positive test

for serum anti-CCP antibodies (also termed ACPA, anti-citrullinated peptide antibodies) as an item, which carries greater specificity for the diagnosis of RA than a positive test for RF. The new 2010 ACR-EULAR criteria are "classification criteria" as opposed to "diagnostic criteria" and high likelihood of evolution to chronic disease with persistent synovitis and joint damage. A score of ≥ 6 fulfils requirements for Definite RA^[11].

MATERIAL AND METHODS

Inclusion Criteria

1. Diagnosed cases of rheumatoid arthritis, irrespective of religion, gender, caste, socio-economic status.
2. Subjects having RA score more than 6.
3. Subjects who could give their history and details for assessment on their own.
4. Age -21 to 50 yrs.

Exclusion Criteria

1. Subjects suffering from lifestyle disorders, any other chronic concomitant diseases like diabetes, hypertension.
2. Subjects who are bed-ridden/dependent.
3. Subjects who cannot give their history and assessment details on their own.
4. Subjects with diagnosed other arthritis like gouty arthritis, tuberculosis arthritis, ankylosing spondylitis, traumatic arthritis etc.

Study Design: A Cross-Sectional Study

Data Compilation

1. Rheumatoid Arthritis was diagnosed through EULAR\ACR 2010 criteria.
2. *Prakriti* of diagnosed patients was analysed using *prakriti* assessment proforma.
3. DAS 28 Score was assessed to define the severity of the disease.

Sample Size: 55

OBSERVATIONS AND RESULT

On the basis of inclusion and exclusion criteria mentioned above and after doing the initial assessment of the subjects enrolled, following observations were made.

Table 1: Distribution of subjects in tabular form on the basis of age group distribution

Age Group	Frequency	Percentage
21-30 Years	13	23.6
31-40 Years	20	36.4
41-50 Years	22	40.0
Total	55	100.0

Table 2: Distribution of subjects in tabular form on the basis of gender

Gender	Frequency	Percentage
Male	6	10.9
Female	49	89.1
Total	55	100.0

Table 3: Distribution of subjects in tabular form on the basis of Habitat

Habitation	Frequency	Percentage
Rural	10	18.2
Urban	45	81.8
Total	55	100.0

Table 4: Distribution of subjects in tabular form on the basis of status of Agni

Agni	Frequency	Percentage
Samagni	11	20.0
Tikshanagni	6	10.9
Mandagni	34	61.8
Vishamagni	4	7.3
Total	55	100.0

Table 5: Distribution of subjects in tabular form on the basis of status of Koshtha

Koshtha	Frequency	Percentage
Madhyam	26	47.3
Kroora	26	47.3
Mridu	3	5.5
Total	55	100.0

Table 6: Distribution of subjects in tabular form on the basis of Prakriti

Prakriti	Frequency	Percentage
K	11	20.0
KV	13	23.6
PK	3	5.5
V	14	25.5
VP	5	9.1
Tridoshaj	9	16.4

Table 7: Distribution of subjects in tabular form on the basis of RA Score in various Prakriti

			RA Score					Total
			6	7	8	9	10	
Prakriti	K	Count	1	2	0	7	1	11
		%	9.1%	18.2%	0%	63.6%	9.1%	100.0%
	KV	Count	4	3	0	3	3	13
		%	30.8%	23.1%	0%	23.1%	23.1%	100.0%
	PK	Count	0	0	0	3	0	3
		%	0%	0%	0%	100.0%	0%	100.0%
	V	Count	1	5	1	3	4	14
		%	7.1%	35.7%	7.1%	21.4%	28.6%	100.0%
	VP	Count	0	2	1	2	0	5
		%	0%	40.0%	20.0%	40.0%	0%	100.0%
	Tridoshaj	Count	0	1	1	5	2	9
		%	0%	11.1%	11.1%	55.6%	22.2%	100.0%
Total		Count	6	13	3	23	10	55
		%	10.9%	23.6%	5.5%	41.8%	18.2%	100.0%

X² (Chi-Square) Value (20 df) = 31.410

Chi-Square Tests			
	Value	Df	P-Value
Pearson Chi-Square	33.793	20	0.028
N of Valid Cases	55		

Here Chi-Square (Calculated Value) > X² (Chi-Square) Value (20 df) = 31.410. Since observations are qualitative, we have used Chi-Square test to test association. From above table we can observe that, P-Value is less than 0.05.

Hence, we conclude that, there is significant association between *Prakriti* and RA Score.

Table 8: Distribution of subjects in tabular form on the basis of DAS Score in various *Prakriti*

			DAS Score			Total
			4 to 6	6 to 8	> 8	
Prakriti	K	Count	2	6	3	11
		%	18.2%	54.5%	27.3%	100.0%
	KV	Count	3	10	0	13
		%	23.1%	76.9%	0%	100.0%
	PK	Count	1	2	0	3
		%	33.3%	66.7%	0%	100.0%
	V	Count	4	10	0	14
		%	28.6%	71.4%	0%	100.0%
	VP	Count	2	3	0	5
		%	40.0%	60.0%	0%	100.0%
Tridoshaj	Count	3	5	1	9	
	%	33.3%	55.6%	11.1%	100.0%	
Total		Count	15	36	4	55
		%	27.3%	65.5%	7.3%	100.0%

Chi-Square Tests			
	Value	Df	P-Value
Pearson Chi-Square	18.945	10	0.041
N of Valid Cases	55		

Since observations are qualitative, we have used Chi-Square test to test association. From above table we can observe that, P-Value is less than 0.05. Hence, we conclude that, there is significant association between *Prakriti* and DAS Score.

DISCUSSION

According to the inclusion criteria, subjects of 21-50 years were enrolled in the study, after taking references from various textbooks and latest national and international journals. We got maximum number of subjects i.e., 22 (44.0%) in the age group of 41-50 years followed by 31-40 years age group, where a total of 20 (36.4%) subjects were enrolled and 13 (23.6%) subjects were enrolled in the age group of 21-30 years (Table 1). The above observation confirms the reported incidence of this disease, as mentioned in textbooks; the incidence of rheumatoid arthritis

increases between 25 to 55 years of age. Among 55 registered subjects of rheumatoid arthritis, 49 subjects (89.1%) were females and 06 (10.9%) were males, (Table 2) suggest that the incidence of rheumatoid arthritis is more common in females than males. Like reported in many auto-immune diseases, rheumatoid arthritis occurs more commonly in females than males, with a 2-3:1 ratio. Various theories have been proposed for explaining the male/female ratio in RA susceptibility. Role of hormones, pregnancy and other hormonal interactions, use of oral contraceptives, fetal-maternal interactions have been considered for the same.

According to table 3, classification on the basis of habitation was done on the basis of rural and urban residence. Out of total 55 Subjects enrolled in the study, 10 (18.2%) were of rural habitation and 45

(81.8%) were residing in urban habitat. There can be few reasons for such an outcome in habitation of RA patients enrolled in the present study. One may be that due to urbanization and changing lifestyle which collectively lead to dietary changes and sedentary lifestyle i.e., *Virudha Aahar* and *Viruddha Cheshtaa*. These factors are the major cause for triggering auto-immune reactions in the body. *Agni* plays a vital role in maintenance of healthy state of body. It is present in each and every *Parmanu* or cell of the body. Every transformation in the body takes place due to *Agni*. Vitiating of *Agni* is the root cause of disease genesis. Assessment of strength of *Agni* becomes essential for planning proper diet, study disease pathogenesis, making medicine intake plan, planning *Shodhan* procedures and making lifestyle modifications. *Agni* is a phenomenon working at cellular level, so its role in the manifestation of auto-immune diseases especially rheumatoid arthritis must be evaluated in detail. As it is already said in our ancient science that *Agni mandya* is the root cause of all diseases. Treatment protocol must include medications and procedures working at the level of *Agni* correction. *Agni* status also depends on the *prakriti* of an individual. In the present study we look at the *Vikriti* caused at *Agni* level.

Among 55 subjects, 34 (61.8%) had *Mandagni*, 11 (20.0%) had *Samagni*, 06 (10.9%) had *Tikshagni* and 04 (7.3%) had *Vishmagni* (Table 4). Here, majority of the registered subjects were suffering from *Mandagni* i.e., hypo-functioning of the metabolic system. *Mandagni* leads to *Ama* formation. *Mandagni* and *Vishmagni* are responsible for *Dhatu vaishamya* and *ama* formation, hence causes *Srotorodha* and *Vata prakopa* resulting finally in *Amavata*. Further, due to *Dhatavagnimandya* proper nutrition to *Rasadhatu* does not take place, resulting in *Dhatukshaya* which leads to vitiations of *Vata*. *Koshtha* defines the entire gastrointestinal system and its functioning of an individual. It is also an inherent attribute which is in accordance with the *prakriti* of an individual. Individuals having dominance of *Vata dosha* have *Kroora koshtha*, *Pitta dosha* have *Mridu koshtha*, *Kapha dosha* dominance have *Madhyam koshtha* similar to *Sama dosha* level.

Distribution of subjects according to *Koshtha* was observed as- 26 (47.3%) were of *Madhyam koshtha* type, 26 (47.3%) had *Kroora koshtha* type and 3 (5.5%) were of *Mridu koshtha* type (Table No.-5). As it is very much evident from our findings that majority of subjects had either *Madhyam koshtha* or *Kroora koshtha* type which is due to *Kapha* and *Vata dosha* dominance respectively. Also, *Amavata* disease itself has supremacy of these two *Dosha* types. Thus, making an individual with *Madhyam* and *Kroora koshtha* type more susceptible towards disease development and progression. According to our assessment of rheumatoid arthritis, we used EULAR /ACR 2010

criteria for diagnosis of rheumatoid arthritis. RA score of 6 or more than 6 were included in the present study. The diagnosis included the laboratory investigations, number of joints involved and duration of disease; fairly covering all the aspects of diagnosis. We made five groups of all the subjects having score 6, 7, 8, 9 and 10 RA Score of different *Prakriti*. Out of total 55 subjects, 6 (10.9%) had RA Score of 6, 13 (23.6%) had 7 scoring, 3 (5.5%) had 8 RA Score, 23 (41.8%) were having 9 RA Score and 10 (18.2%) were under RA Score 10 (Table 7). Of the 6 subjects having RA Score 6-01 had *Kaphaj prakriti*, 4 had *Kapha-vataj* constitution and 01 was of *Vataj prakriti*. 13 subjects who had RA Score of 7- 02 were of *Kaphaj* constitution, 03 of *Kapha-vataj* type, 05 subjects had *Vataj prakriti*, 02 had *Vata-pittaj* constitution and 01 was of *Tridoshaj prakriti* type. 3 subjects who had RA Score of 8 were of *Vataj-01*, *Vata-pittaj-01* and *Tridoshaj-01 Prakriti* type. 23 individuals had RA score of 9, of which-07 had *Kaphaj* constitution, 03 were of *Kapha- vataj prakriti*, 03 had *Pitta-kaphaj* body constitution, 03 had *Vataj* type, 02 had *Vata-pittaj* and 05 had *Tridoshaj* constitution. 10 subjects had RA Score of 10, of which 01 was of *Kaphaj* type, 03 of *Kapha-vataj prakriti*, 04 of *Vataj* constitution, 02 had *Tridoshaj* body constitution. Since observations are qualitative, we have used Chi-Square test to test association. From above table we can observe that, P-Value is less than 0.05. Hence, we conclude that, there is significant difference between *Prakriti* and RA Score. Disease Activity Score, i.e., DAS28 criteria gives us an idea about severity of disease and treatment efficacy. It is a combined index providing a measure of disease activity in RA, comprising of (i) the number of swollen joints (of possible 28) (ii) the number of tender joints (of possible 28) (iii) Erythrocyte sedimentation rate (iv) VAS- visual analogue scale- A psychometric response scale for parameters that range across a continuum of values. The VAS pain scale ranges from "no pain" to "worst pain" and patients mark a line to indicate how they are feeling. The DAS can be calculated using a specific program or calculator - or by going to a website, www.4s-dawn.com/DAS28/Scoring of DAS28 - DAS 28 (>5.1)= high disease activity, DAS 28 (3.2 to < 5.1)= Moderate disease activity, DAS 28 (2.6 to <3.2)= Mild disease activity and DAS 28 (<2.6) = remission of disease^[12].

In present study, all our subjects had DAS28 higher than 5.1 to 8.56, indicating a high disease activity. So, just to have a fair idea about the severity of disease activity, we made three groups; where 15(27.3%) subjects had DAS28 between 4 to 6, 36(65.5%) had score between 6 to 8 and 04(7.3%) subjects scored more than 8. Of 11 *Kaphaj prakriti* individuals, 02(18.2%) had score between 4 -6, 06(54.5%) had score between 6-8 and 03(27.3%) had

score more than 8. Out of 13 *Kapha-vataj prakriti*, 03 (23.1%) had score between 4–6 and 10 (76.9%) scored between 6 – 8. Among *Pitta-kaphaj prakriti* individuals 01(33.3%) scored between 4 –6 and 02(66.7%) had score between 6–8. Out of 14 *Vataj prakriti* individuals, 04(28.6%) scored between 4- 6 and 10 subjects had score between 6 – 8. Among the 5 *Vata-pittaj* subjects, 02(40.0%) had DAS28 between 4-6 and 03 (60.0%) scored between 6 -8. Out of 09 subjects having *Tridoshaj prakriti*, 03(33.3%) scored between 4 to 6 and 05 (55.6%) were between 6 to 8 and 01(11.1%) had more than 8. Subjects having *Vata- kapha* dominance. Since observations are qualitative, we have used Chi- Square test to test association. From the table no-8 we can observe that, P-Value is less than 0.05. Hence, we conclude that, there is significant association between *Prakriti* and DAS Score.

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Cite this article as:

Bandana Sharma, Shilpa Dogra, Vividha Mahant. Assessment of Disease Severity in Rheumatoid Arthritis Subjects of Different Prakriti. International Journal of Ayurveda and Pharma Research. 2026;14(6):67-72.

<https://doi.org/10.47070/ijapr.v14i6.4184>

Source of support: Nil, Conflict of interest: None Declared

*Address for correspondence

Dr. Bandana Sharma

Assistant Professor,
PG Department of Kriya Sharira,
Shiva Ayurvedic Medical College and
Hospital, Himachal Pradesh, India.
Email:

9283sharmabandana@gmail.com

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