

EVALUATION OF PRESCRIPTION PATTERN IN INDIAN ADULT POPULATION FOR RHEUMATOID ARTHRITIS : A CROSS SECTIONAL STUDY

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ABSTRACT

Background: Rheumatoid arthritis (RA) is a chronic inflammatory disease that affect patients' social, emotional, and physical well-being. In most Western countries, the prevalence of RA is approximately 0.5– 1%, affecting more females than males, the prevalence of RA in India is approximately 0.75% and increasing trend has been noticed.

Aims and Objectives : This observational cross-sectional study was designed to study the prescription patterns in Rheumatoid arthritis patients in Indian adult population in orthopaedic outpatient department in a tertiary care teaching hospital.

Materials and Methods: This study was conducted over the span of 1 year ,where 100 patients were enrolled in study following the inclusion and exclusion criteria after taking informed consent. All the demographic data and complete prescription of rheumatoid arthritis were collected on predesigned semi structured proforma to evaluate the prescription pattern . The collected prescriptions were analyzed by using WHO drug use indicators.

Results: Total of 100 prescriptions was analyzed. 77 (77%) were females and 23(23%) were males. Most commonly presenting age group was 31-45 years 46 (46%). Family history and RA factor was positive in 25 (25%) and 80 (80%) patients respectively. Anti-ccp was raised in 87 (87%) patients. The comorbid conditions were OA 13(13%) type-2 diabetes mellitus 8 (8%), hypertension 8 (8%), GERD 9 (9%) . Total of 446 drugs were prescribed during the study period. The prescribed drugs were disease modifying anti-rheumatic drugs (DMARDs) 145 (32.51%), vitamin-D3 and calcium supplements 104 (23.32%), analgesics 56 (12.56%), antacids 58 (13%), others 69(15.47%). Monotherapy with one DMARD 55 (37.9%) or as dual drug therapy i.e two DMARDS therapy 45(31.03%) was prescribed in prescriptions. 4.46 drugs per prescription, 422 (94.62%) drugs by generic names and 88.79% drugs were prescribed from the National List of Essential Medicine (NLEM) 2022.

Conclusions: There is a requirement for data, which can help implement better strategy for regulation of the prescription of DMARDs at all levels. More studies will help articulate guidelines for prescribing this group of drugs for rationally usage.

Keywords: Disease modifying anti-rheumatic drugs, Rheumatoid arthritis, Prescription pattern

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INTRODUCTION

Rheumatoid arthritis (RA) is a chronic inflammatory disease that affect patients' social, emotional, and physical well-being. Etiology of RA is unknown. ^[1] The principal pathology is inflammation within synovial joints, causing pain, swelling and stiffness and progressing to erosion and eventually joint destruction. RA is a chronic inflammatory disorder that may damage blood vessels, bone marrow, GI tract, skin, lungs and eyes. ^[2] The etiology of RA could be due to genetic and non-genetic factors such as hormonal, environmental, and infectious factors. ^[3] In most Western countries, the prevalence of RA is approximately 0.5– 1%, affecting more females than males with an average age of onset of 50 years. Incidence ranges from 24 to 48 new cases per 100,000 depending on country, time period and age of the population. ^[4]

Community studies point to a prevalence of 0.5% to 1% in adult population worldwide. About 0.75 % of adult Indian population is affected by the disease. There is an increase in incidence of RA from age of 25 continuing the age of 55 years, after which there is a plateau phase up till the age of 75 and then decreases. The prevalence of chronic diseases in modern industrialized nations is increasing and among these intractable conditions RA stands out as a major cause of multiple medical problems. The affected individuals experience significant morbidity including loss of function, joint destruction and permanent deformity with higher mortality than in general population. Hence long term efficacy and tolerability of available therapies should be assessed. ^[5]

Rational use of drug stresses on patients receiving medication appropriate to their clinical need in doses that meet their own individual requirements for an adequate period of time and at the lowest cost to them and their community. ^[5] The study of prescription pattern is an important component of medical audit which helps in monitoring, evaluating and making necessary modification in prescribing practice to achieve a rational and cost effective medical care. ^[5] Selection of a drug used in RA DMARDs, as a first line drug or combined therapy should be based on both pharmacologic properties of the compound like efficacy, safety profile and also disease characteristic of the patients like the duration of the disease, symptoms since diagnosis and demographic parameters. ^[6]

MATERIALS AND METHODS

This study was conducted over the span of 1 year in outdoor patient Department of orthopedics, Rajindra hospital attached to Government Medical College, Patiala. Where 100 patients were enrolled in study following the inclusion and exclusion criteria after taking informed consent.

INCLUSION CRITERIA

1. Adults of either gender Male or Female
2. Age >18 year with rheumatoid arthritis.
3. Patients are receiving any monotherapy or combination.
4. Patient with or without co-morbidities.

- Exclusion Criteria:-**
1. Children & Pregnant women.
 2. Previously Allergic patients.
 3. Patients having age less than 18 yrs or more than 75yrs.
 4. Patients currently enrolled in another investigational study.
 5. Patients who not willing to participate in the study.

All the data were collected from patients attending the orthopedic outpatient department on predesigned semi structured proforma. Thus prescription of patients were analyzed by using five WHO core prescribing indicators.^[7] i.e. 1. Average number of drugs per prescription. 2. Percentage of drugs prescribed by generic name or brand name. 3. Percentage of prescriptions with an antibiotics prescribed. 4. Percentage of prescription with injection prescribed. 5. Percentage of drugs prescribed from essential medicine list. National List of Essential Medicines (NLEM)2022 of India was used for assessing the number of drugs prescribed from the essential list. Statistical analysis was done using IBM SPSS (Statistical Product and Service Solutions) version 22.0. Quantitative data was expressed using mean and standard deviation and qualitative data was expressed in frequency and percentage.

RESULTS:

A total of 100 patients enrolled in 1 year duration of study. 77 (77%) were females and 23 (23%) were males (Figure 1). Most commonly presenting age group was 31-45 years 46 (46%) (Table 1). Family history and RA factor was positive in 25 (25%) and 80 (80%) patients respectively. Anti-ccp was raised in 87 (87%) patients. Maximum number of patients were housewives 63(63%),and maximum number of patients i.e.,33 (33%) had secondary education status followed by primary education (33%). In present study the most common co-morbid disease was osteoarthritis (13%) followed by GERD (9%) (Table 2) .

Figure1: Gender- wise Distribution

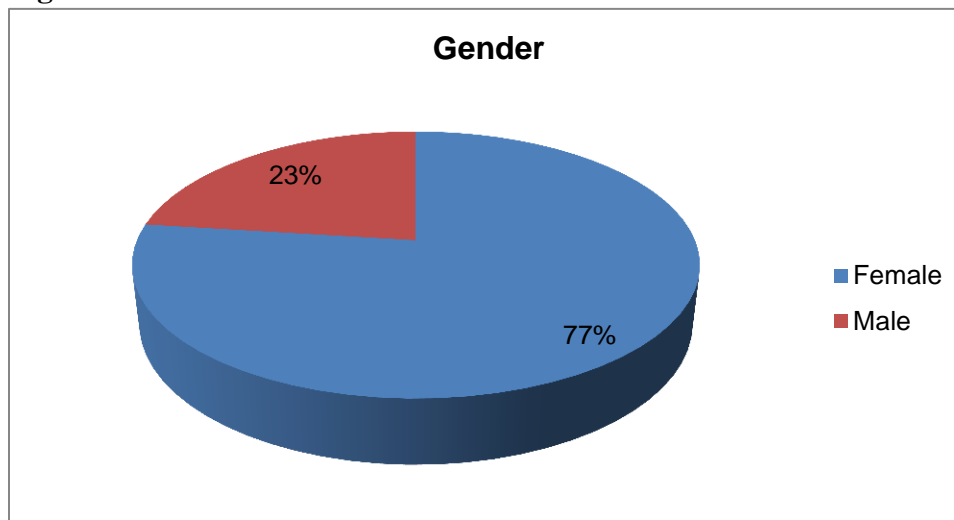


Table1 : Age-wise distribution

Age Group (Years)	Number of Patients	Percentage
31-45	46	46%
46-60	39	39%
61-75	15	15%
Total	100	100%
Mean±SD	49.30±10.19	
Median	46.50	
Range	31-75	

Table 2 : Showing Demographic profile

Parameters	Number of Prescriptions	Percentage
Positive Family History	25	25%
Positive RA Factor	80	80%
Raised Anti-CCP	87	87%
Occupation		
Farmer	9	9%
Housewives	63	63%
Private Job	27	27%
Student	1	1%
Education Level		
Illiterate	20	20%
Primary	33	33%
Secondary	33	33%
University	14	14%
Co-Morbidities		
DM2	8	8%
GERD	9	9%
HTN	8	8%
OA	13	13%

Total of 446 drugs were prescribed during the study period. The prescribed drugs were disease modifying anti-rheumatic drugs (DMARDs) 145 (32.51%), vitamin-D₃ and calcium supplements 104 (23.32%), analgesics 56 (12.56%), antacids 58 (13%), others 69(15.47%). 4.46 drugs per prescription, 422 (94.62%) drugs by generic names and 89.69% drugs were prescribed from the National List of Essential Medicine (NLEM) 2022(Table 3) .

Table 3: Drugs prescribed

	Drugs	Number	Percentage
DMARDs 145 (32.51%)	Methotrexate	81	55.86%
	Hydroxychloroquine	54	37.24%
	Sulfasalazine	6	4.14%
	Leflunomide	43	2.76%
Analgesics 56 (12.56%)	Indomethacin	22	39.29%
	Etoricoxib	14	25%
	Diclofenac	20	35.71%
Antacid 58 (13%)	Pantoprazole	39	67.24%
	Omeprazole	19	32.76%
Steroids 14 (3.14%)	Prednisolone	4	28.57%
	Deflazacort	10	71.43%
Calcium and Vitamin D ₃ 104 (23.32%)	Calcium	52	50%
	Vitamin D ₃	52	50%
Others 69 (15.47%)	Folic Acid	55	79.71%
	Ondansetron	14	20.29%

In our study, the average number of drugs per prescription was 4.46, 94.62% of drugs were prescribed by their generic name ,88.79% drugs were prescribed from the National Essential Medicine List 2022 (Table 4).

Table 4 : WHO parameter analysed

SR. NO.	WHO PRESCRIBINGINDICATOR'S	RESULTS
1	Average Number of Drugs per Prescription	4.46%
2	Percentage of Drugs Prescribed by Generic Name	94.62%
3	Percentage of Drugs Prescribed by EML	88.79%
4	Percentage of prescriptions with an antibiotic prescribed	0%

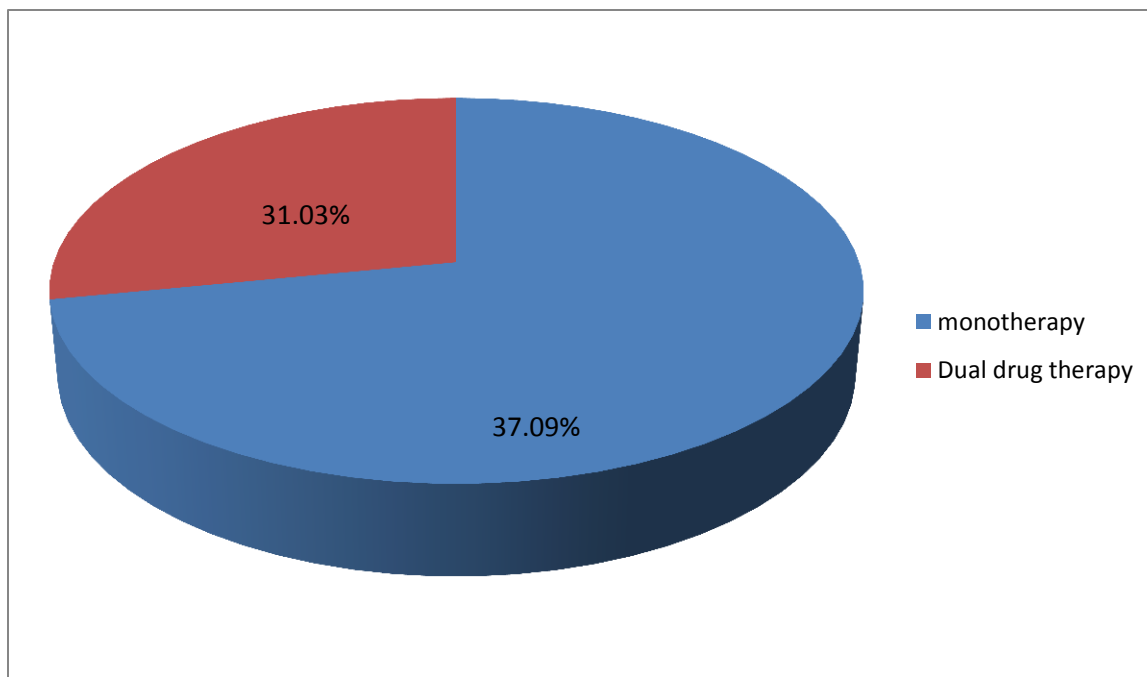
5	Percentage of prescriptions with an injection prescribed	0%
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Among the drugs prescribed for RA, DMARDs comprised 32.51% of all the drugs either as Monotherapy with one DMARD 55 (37.9%) or as dual drug therapy i.e two DMARDs therapy 45(31.03%) was prescribed in prescriptions. Among the DMARDs, methotrexate was present in 81 prescriptions (55.86%). Hydroxychloroquine was present in 54 prescriptions (37.24%). Sulfasalazine was prescribed in 16 prescriptions (4.14%).Leflunimide was present in 4(2.76%). Methotrexate was the DMARD of choice used as Monotherapy (Table 5 & Figure 2).

Table 5: Disease –modifying anti rheumatic drugs in prescriptions

DMARD therapy	Number of prescriptions(%)
Monotherapy with one DMARD	55(37.9%)
Methotrexate	36(24.8%)
Hydroxychloroquine	19(13%)
2 DMARD therapy/Dual drug therapy	45(31.03%)
Methotrexate+ Hydroxychloroquine	35(24.1%)
Methotrexate +Sulfasalazine	6(4.13%)
Methotrexate+Leflunomide	4(2.7%)

Figure2 : DMARD prescribed as Monotherapy/Dual drug therapy



DISCUSSION

Rheumatoid arthritis is a chronic, systemic, inflammatory autoimmune disorder causing symmetrical polyarthritis of large and small joints, typically presenting between the ages of 30 and 50 years.^[8] Prescription writing can be illustrate as an art, since it reflects the directions given by the prescriber to the patients or their representatives.^[9] Drug uses studies can actually analyse the recent trend of prescription pattern which will further help to identify the problems and provide feedback to prescribers.^[10] Moreover, present study gives an understanding for conducting similar studies in future about prescription patterns by covering multicentric population and adding more parameters to provide feedback to clinicians and to encourage rational prescription. Efficient RA therapy can improve patients' quality of life.^[11] Majority of the patients were females, and the age of onset was middle age.^[11] our study also showed female predominance i.e 77% female and 23% male in agreement with study conducted by Mittal et al. in india.^[12] The lab parameters as RA factor were positive in 80%, which is in relation to the study by O'Dell JR et al.^[13] The anti-ccp was raised in 87% of the patients which is similar to the study by Shini VK et al .where anti-ccp was raised in 87.29% of the patients.^[14] In our study 38(38%)patients had other comorbid conditions. Another study conducted by Singh JA et al. also showed nearly similar Co-morbidities were present in their study (34%) with OA being the most common, followed by DM type 2 and HTN.^[15] In our study, maximum number of patients i.e., (33%) had secondary education status followed by primary education (33%), illiterate (20%) and University (14%). A study done by Mukherjee D et al. showed that majority of patients had primary education (36%), followed by secondary education(33%) , illiterate (13%) and University (16%) which is nearly similar with our study.^[16] In present study maximum number of patients were housewives (63%), private job (27%), farmer (9%), student (1%). Compatible with study by Kashefi S et al. in which the 66.4% were housewives, 10.3% were farmers, 6.9% labourers and 16.5% others.^[17] Disease Modifying Anti-Rheumatic Drugs (DMARDs) are usually given with NSAIDs or corticosteroids. They are given not only to relieve symptoms but also to slow progression of the disease. Non-biological DMARDs include methotrexate , leflunomide , hydroxychloroquine and sulfasalazine In present study DMARD (32.51%) were prescribed Methotrexate (MXT) 55.86% and hydroxychloroquine (HCQ) 37.24% and Sulfasalazine 4.14% and Leflunomide 2.76% which is in accordance with study by Almeida et al. showed most commonly prescribed DMARD were methotrexate 39.8% followed by hydroxychloroquine (30.6%).^[18] Methotrexate (MXT) 51.90% and hydroxychloroquine (HCQ) 48.10% were prescribed DMARD in Dutta SB et al. study which is also in accordance with our result.^[19] In present study the most commonly prescribed drug following DMARDs was Analgesics i.e 12.56% which is in accordance to the study done by Dutta SB et al. the prescribed analgesics were 18.80% .^[19] In our study one DMARD i.e Methotrexate as monotherapy was the DMARD of choice . Study by Shini et al. reported that majority of the patients were on single DMARD.^[14] Another study by Sukhpreet et al. also found that combination of 2 DMARDs was commonly prescribed which is not in accordance with our

result.^[20] Calcium supplements and gastroprotective agents were also given in a significant number of prescriptions, to prevent drugs ADRs like epigastric pain and steroid-associated osteoporosis. To prevent methotrexate associated anemia folic acid was given .^[21]In our study 4.46 drugs per prescription, in another study by Dutta SB et al. the average number of dugs per prescription was 3.67 drugs.^[19] The drugs prescribed by generic names were 422 (94.62%), while in another study by Dahiya A et al. in which 40.7% of the drugs were prescribed by generic names which is not in accordance with our result.The drugs prescribed from the National List of Essential Medicine (NLEM) 2022 were 396 (88.79%) prescribed.which is in accordance with Dahiya A study in which 76.3% drugs were prescribed from NLEM 2015. ^[21]

CONCLUSION

More studies are needed to be done regarding prescription of DMARDs , that would help to articulate guidelines for prescribing this group of drugs for rationally usage . Many studies have reported the most commonly used regimen was MTX monotherapy followed by MTX + HCQ combination . All these matters can only be solved in the presence of considerable and credible data, which can navigate the policies to regulate the prescription of DMARDs at all levels and their effectual implementation.

REFERENCES

1. Tobón GJ, Youinou P, Saraux A. The environment, geo-epidemiology, and autoimmune disease: Rheumatoid arthritis. *Autoimmunity reviews*. 2010 Mar 1;9(5):A288-92.
2. Morris J. Brown, Pankaj Sharma, Peter N. Bennett, *Clinical Pharmacology. Drugs for inflammation and joint:12thed.* London: Elsevier; 2019.p. 248-66.
3. Mojca FB, Kerstin K, Steffen G Interplay between genetic and epigenetic mechanisms in rheumatoid arthritis. *Epigenomics* 2017; 9: 493- 504.
4. Arkema EV, Karlson EW, Costenbader KH. A prospective study of periodontal disease and risk of rheumatoid arthritis. *Int. J. rheumatology*. 2010 Sep 1;37(9):1800-4.
5. Ranganath DD, Ganguly D, Shankarappa M, Nagaraj KB, Chintha R. Analysis of drug prescribing trends in treatment of rheumatoid arthritis at a tertiary care hospital, Karnataka, India. *Int J Basic Clin Pharmacol*. 2016;5:1790-97.
6. Shaikh U, Chandra SN, Jayasree T, Shankar J, Kotipalli R. Prescription Trends in department of Orthopaedics at Tertiary Care Teaching Hospital. *Journal of Chemical and Pharmaceutical Research*. 2013;5(11):512-7.

7. Singh T, Banerjee B, Garg S, Sharma S. A prescription audit using the World Health Organization-recommended core drug use indicators in a rural hospital of Delhi. *Journal of education and health promotion*. 2019;8(1):34-37
8. Majithia V, Geraci SA. Rheumatoid arthritis: diagnosis and management. *The American journal of medicine*. 2007 Nov 1;120(11):936-9.
9. Jain S, Khan ZY, Upadhyaa P, Kumar A. Assessment of Prescribing Pattern in a Private Teaching Hospital in India. *International Journal of Pharma Sciences*. 2012;3(3):219-22.
10. Ahmed M, Ali A, Rahman Z, Khan M. A study on prescribing patterns in the management of Arthritis in the department of Orthopaedics. *Scholars Research Library*. 2012;4(1):5-27.
11. Wong JB, Ramey DR, Singh G. Long-term morbidity, mortality, and economics of rheumatoid arthritis. *Arthritis Rheum* 2001;44:2746-9.
12. Mittal N, Mittal R, Sharma A, Jose V, Wanchu A, Singh S. Treatment failure with disease-modifying antirheumatic drugs in rheumatoid arthritis patients. *Singapore Med J* 2012;53:532-6.
13. O'Dell JR, Haire CE, Erikson N, Drymalski W, Palmer W, Eckhoff PJ, et al. Treatment of rheumatoid arthritis with methotrexate alone, Sulfasalazine and hydroxychloroquine or a combination of three medications. *NEJM*. 1996;334:1287-91.
14. Shini VK, Aboobacker S, Revikumar KG. Pharmacoeconomic Study of DMARDS in the treatment of Rheumatoid Arthritis. *Int J of pharm scien review and research*. 2010;5:148-54.
15. Singh JA, Furst DE, Bharat A, Curtis JR, Kavanaugh AF, Kremer JM, et al. 2012 update of the 2008 American college of rheumatology recommendations for the use of disease-modifying antirheumatic drugs and biologic agents in the treatment of rheumatoid arthritis. *Arthritis Care Res (Hoboken)* 2012;64:625-39.
16. Mukherjee D, Naiya S, Chakraborty S, Rahul D. Chakrabarty, Sucharita Patra. Adherence to methotrexate therapy among rheumatoid arthritis patient in Eastern India. *International Journal Advance Medicine*. 2020 Jun;7(6):1-7.
17. Kashefi S, Lee SM, Mallaysamy SR, Thunga G. Demographic clinical presentation and drug prescription pattern in patients with rheumatoid arthritis in south Indian tertiary care teaching hospital. *Int J Pharm Sci*. 2016;8(8):251-7.

18. Almeida M, Almeida JVM, Bertolo MB. Demographic and clinical features of patients with rheumatoid arthritis in Piauí, Brazil-evaluation of 98 patients. *Rev Bras Rheumatol.* 2014;54:360-5.
19. Dutta SB, Beg MA, Bawa S, Kaur A, Vishal S. Prescribing pattern in Rheumatoid Arthritis patients in a tertiary care teaching hospital. *International Journal of Basic & Clinical Pharmacology.* 2017 Jun;6(6):1486-90.
20. Sukhpreet, Agarwal V, Tiwari P. Treatment and monitoring costs in rheumatoid arthritis: Preliminary results from an Indian setting. *Indian J Pharm Sci* 2007;69:226-31.
21. Dahiya A, Kalra BS, Saini A, Tekur U. Prescription pattern in patients with rheumatoid arthritis in a teaching tertiary care hospital. *MAMC J Med Sci* 2016;2:33-7.