

THE RELATIONSHIP OF DRUG THERAPY PROBLEMS WITH POLYPHARMACY AMONG RHEUMATOID ARTHRITIS PATIENTS: A MULTICENTER CROSS-SECTIONAL STUDY

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Abstract

Background: People are not living in better health in the world. The raised in multimorbidity, joined with growing number of use of medicines, became a concern of healthcare professionals significantly. Polypharmacy is significantly related with medicine associated problems.

Materials and Methods: A multi-center cross-sectional study was conducted in the 3 clinical setups of Hyderabad, Province Sindh, Pakistan from December 2023 to March 2024. The calculated sample size for the study was 357 using Cochran formula. Both gender male and female patients of age above 20 years and diagnosed with Rheumatoid Arthritis disease were included in the study. Patients who were below 20 years age and having chronic disease were excluded. The data was collected by conducting structured interview of the patients to collect the patient's demographic data and the DTPs data was collected by using patient's prescription and medical file. Data were analyzed using Statistical Package for Social Sciences version 26 for descriptive analysis, cross tabulation and chi square test were performed for analyzing the association between the variables, and the qualitative data.

Results: Out of 357 participants 76.8% (274) was female population and 23.2% (83) was male population. The history of Rheumatoid Arthritis in family showed that 74.2% (n=265) of patients do not have family history only 25.8% (n=92) having family history and 77.3% (n=276) patients were having the comorbidities. The total identified number of drug therapy problems were 753 in 357 patients. The most common prescribed drug class was Glucocorticoids 353 (98%). Drug selection problem was reported with its association with polypharmacy as the polypharmacy increased the drug selection problem (p value is 0.003) and dose selection was also found significant having p value 0.002.

Conclusion: This study showed that the drug related problems are more prevalent in rheumatoid arthritis patients, this study also demonstrated that the drug related problems are strongly associated with polypharmacy.

INTRODUCTION

People are living longer than today in the world, but usually not in better health [1]. With long life, many people might experience a time in which the multi-morbidity is marked significantly [2]. The raised in multimorbidity, joined with growing number of use of medicines, became a concern of healthcare professionals significantly, mainly because of the risk of possibly inappropriate usage of medicines in young adults and older population [3]. Polypharmacy, defined as the simultaneous usage of five or more than five medications [4], is significantly related with medicine associated problems. These issues include situations or events which involve drug therapy which interfere actually or potentially with the required outcome of health [5]. This could include inappropriate prescribing, poorly adherence, overdose, underdose, not appropriate drug selection, inadequate monitoring, adverse effects, and drug interactions are noticeable which are using a raised number of medicines usually raises the risk of adverse effects, nonadherence, & higher the health expenditures, with patients who are taking five or more than five medicines usually encounter the significant drug associated issues [6-8]. The occurrence of polypharmacy and its associated risk of drug related issued in RA patients are interlinked to raise the health expenditures, more frequent hospitalization and adverse outcomes like falls, mental issues, and decreased quality of life [9,10].

The aim of the present study was to assess the relationship of drug therapy problems with polypharmacy among rheumatoid arthritis patients.

MATERIALS AND METHODS

Study design, setting and duration

A multi-center cross-sectional study was conducted in the 3 clinical setups of Hyderabad, Province Sindh, Pakistan from December 2023 to March 2024. The number of required participants was calculated from the following Cochrane Formulae; $N = Z\alpha^2 pq/d^2$, where p represents the estimated prevalence with DRPs of 0.633, $Z\alpha$ is the level of significance at the 95% confidence interval of 1.96, q is 1-p of 0.367 and d represents

the precision of the estimate of 0.05. The calculated sample size for the study was 357. Both gender male and female patients of age above 20 years and diagnosed with Rheumatoid Arthritis disease were included in the study. Patients below 20 year's age having chronic diseases were excluded.

Source of Data

Data of patients who met the inclusion criteria were recorded. Those patients, who were approached at the physician office right after they finished their dialogue with the physician and confirmed diagnosis of RA. Once a patient was recruited by a study conductor, he or she was fully assessed for DTPs according to the following procedure: collecting patient's information; such as demographic information, Age, gender, social habits, previous disease history, previous treatment history, patient's knowledge, using a specially designed data sheet. Prescription, treatment charts, laboratory reports was assessed for drug therapy problems; drug selection, dose selection, drug formulation, and treatment duration, were recorded on specially designed data sheet to record the prescription data of study participants.

Data collection method

The data was collected by conducting structured interview of the patients to collect the patient's demographic data. And the DTPs data was collected by using patients Prescription and medical file.

Data analysis strategies

For quantitative data, Statistical Package for Social Sciences version 26 was used for descriptive analysis with the confidence interval 95% and margin of error 5%. Frequency and percentages were computed. Cross tabulation and chi square test was performed for analyzing the association between the variables, and the qualitative data was described theoretically.

Ethical Approval

This study was approved by the Ethical Committee of the Director, Research & Graduate Studies of University of Sindh, Jamshoro, Pakistan (Date: 27.10.2023 /No. DRGS/ 3446).

RESULTS

A total of 4093 patients visited the three different physician’s clinics, and 357 (8.7%) diagnosed with RA were extracted from 413 patients and DTPs also have been detected. Out of 357 participants 76.8% (274) was female population and 23.2% (83) was male population. Age wise distribution data showed that the highest number of patients fall in the above 60 years range 48.5% (173) followed by 51-60 years 28.9% (103), 41-50 years 14.0% (50), 31-40 years 6.4% (23) and 21-30 years 2.2% (8). The social habits of patient’s data table showed that the most of patients were not having no any habit 43.7%(n=156), followed by beetle Nut/ Arreca Nut 27.5%(n=98), smoking 21.8%(n=78), and Alcohol 7.0%(n=25). The history of RA in family table showed that 74.2% (n=265) of patients do not have family history only 25.8%(n=92) having family history. The duration of disease data showed that highest percentage of patients suffer from 1-5years 54.1%(n=193), more than 5 years’ percentage was 39.2%(n=140), only 6.7%(n=24) was in less than 1-year category and 77.3%(n=276) patients having the comorbidity and the most common comorbidity was cardiovascular diseases followed by ulcer, Diabetes, Dyslipidemia and Osteoporosis Table1.

Drug Therapy Problem Characteristics

The total identified number of drug therapy problems were 753 in 357 patients and 2.1

problem per patient, drug therapy problems were classified into standard categories such as “Drug selection, Dose Selection, Treatment duration and Drug formulation”, the most of the drug problem was related to drug selection that’s percentage is 67.2%(n=240) where that was inappropriate drug selection (Table2), followed by inappropriate treatment duration related problem percentage was 55.7%(n=199) (table3), Dose selection problems were on second most category having 56.0% (n=200) inappropriate dose were prescribed Table4, least problems were identified in Drug formulation 31.9%(n=114) Table5 and the 54.9%(n=196) patients were prescribed more than 5 drugs Table 6.

Drug Therapy Problems Associated with Polypharmacy

The crosstabulation analysis showed that the drug selection problem is associated with polypharmacy as the polypharmacy increases the drug selection problem will increase (p value is 0.003) Table7. Dose selection was also found significant having p value 0.002 which is less than 0.05 table#8, on other hand the treatment duration was calculated insignificant that’s p value was 0.310 which is more than 0.05 Table9, and drug formulation was also found insignificant (p-value =0.55) which is more than 0.05 table10. Age is one of factor that caused the polypharmacy which ultimately increased drug therapy problems. Table11. The most common prescribed drug Class was Glucocorticoids that’s frequency was 353 (98%) followed by DMARDs that frequency was 344(96%), NSAIDs frequency was 302 (84%), Multivitamins 258 (79.80%), Muscle relaxant 185 (51%) and others 263 (60%) in Figure 1.

Table1. Sociodemographic and Clinical Characteristics of Patients

Variables		N (%)
Age	21-30 years	8(2.2%)
	31-40 years	23(6.4%)
	41-50 years	50(14.0%)
	51-60 years	103(28.9%)
	Above 60 years	123(48.5%)
	Total	357(100.0%)
Gender	Female	274(76.8%)

	Male	83(23.2%)
Social Habits	Smoking	78(21.8%)
	Beetle Nut/Arreca Nut	98(27.5%)
	Alcohol	25(7.00%)
	No any	156(43.7%)
History Of RA	Yes	92(25.8%)
	No	265(74.2%)
Duration of Disease	Less than 1 year	24(6.7%)
	1- 5 years	193(54.1%)
	More than 5 years	140(39.2%)
Presence of Comorbidity	Yes	276(77.3%)
	No	81(22.7%)

Table2. Drug Selection

Drug Selection			
		Frequency	Percent
Valid	Appropriate	117	32.8
	Inappropriate	240	67.2
	Total	357	100.0

Table 3. Treatment Duration

Treatment Duration			
		Frequency	Percent
Valid	Appropriate	158	44.3
	Inappropriate	199	55.7
	Total	357	100.0

Table 4. Dose Selection

Dose Selection			
		Frequency	Percent
Valid	Appropriate	157	44.0
	Inappropriate	200	56.0
	Total	357	100.0

Table 5. Drug Formulation

Drug Formulation			
		(f)	Percent%
Valid.	Appropriate.	243	68.1
	Inappropriate.	114	31.9
	Total	357	100.0

Table 6. Polypharmacy

Polypharmacy			
		(f)	Percent%
Valid.	No	161	45.1
	Yes	196	54.9
	Total	357	100.0

Table 7. Drug Selection * Polypharmacy

Crosstab						
		Polypharmacy			Total	P Value
		No	Yes			
Drug Selection	Appropriate	66	51	117	0.003	
	Inappropriate	95	145	240		
Total		161	196	357		

Table 8. Dose Selection * Polypharmacy

Crosstab						
		Polypharmacy			Total	P-Value
		No	Yes			
Dose Selection	Appropriate	85	72	157	0.002	
	Inappropriate	76	124	200		
Total		161	196	357		

Table 9. Treatment Duration * Polypharmacy

Crosstab						
		Polypharmacy			Total	P- Value
		No	Yes			
Treatment Duration	Appropriate	76	82	158	0.182	
	Inappropriate	85	114	199		
Total		161	196	357		

Table 10. Drug Formulation * Polypharmacy

Crosstab						
		Polypharmacy			Total	P-Value
		No	Yes			
Drug Formulation	Appropriate	107	136	243	0.317	
	Inappropriate	54	60	114		
Total		161	196	357		

Table 11. Age * Polypharmacy

Crosstabulation					
		Polypharmacy		Total	P-Value
		No	Yes		
Age	21-30 years	7	1	8	0.021
	31-40 years	13	10	23	
	41-50 years	28	22	50	
	51-60 years	44	59	103	
	Above 60 years	69	104	173	
Total		161	196	357	

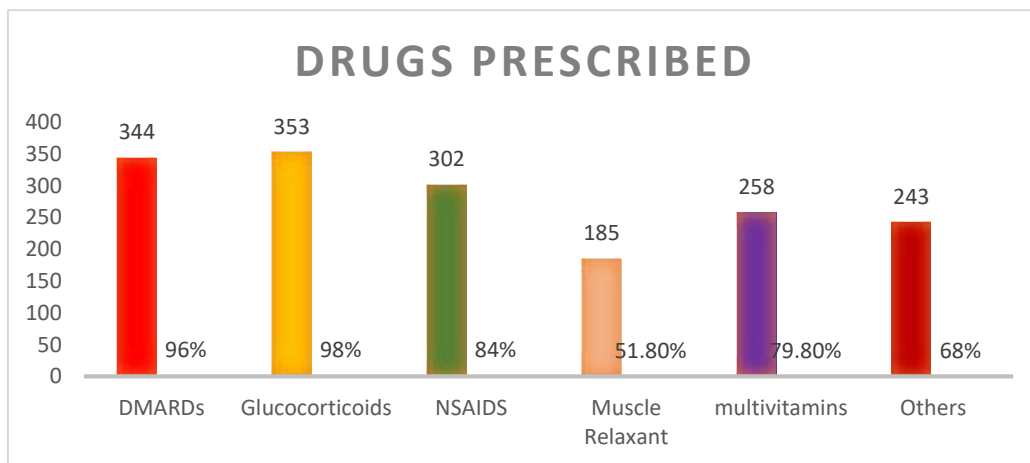


Figure 1. Prescribed Drugs

DISCUSSION

The identified prevalence of drug therapy problems was 8.7%. This study was comparable to a study, which founded 9.8% prevalence of Drug therapy problems [11]. The average DRP per patient was 2.1, this study was compared to a study, in which the DRPs per patients was 3.1 [12]. This study also observed the more frequently identified drug therapy problem was related to drug selection, comparatively in a study, in which the drug selection problem was identified inappropriate drug selection [13]. On the secondly the inappropriate dose selection related problem was also identified in this study. According to a study, the dose related problems were too high in that study [14]. This study also investigate that the drug related problems are

strongly associated with polypharmacy as the polypharmacy was found in the prescription the drug problems were more identified in the prescription of polypharmacy. As per findings of a study, the polypharmacy was one of the major causes of drug related problems, the patients took more than five drugs are more likely to develop the DTP than the patients who took less than 5 drugs in day, the polypharmacy was the major predictor of drug related problems [15].

CONCLUSION

This study helped to determine the drug related problems and its types in rheumatoid arthritis patient along with the factors that are caused the drug related problems. This study showed that the drug related problems are more prevalent in rheumatoid arthritis patients, this study identified

that the most common drug therapy problem in rheumatoid arthritis patient were related to drug selection and dose selection and treatment duration and drug formulation these four sub categories were identified and drug selection and dose selection were found significant. This study also demonstrated that the drug related problems are strongly associated with polypharmacy. If, the drug related problems were identified timely then the treatment outcome will be enhanced.

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