Assessment of Prescription Pattern Prescribed to Patients Affected by Rheumatoid Arthritis: A Cross Sectional Health Survey Conducted in Different Hospitals of Bangladesh

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Authors’ contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Rheumatoid arthritis (RA) is a systemic autoimmune disease that affects the joints with variable degrees of severity depending on the patient. As it is a chronic disease and patients have to go through medication for a long period of time, choosing the proper drug is very crucial to avoid irrational use of drug. The present study was designed to evaluate the usual prescription pattern that are prescribed by the physicians, and unveiling the scenario of patient care treating for arthritis.

Materials and Methods: The current survey-based research study was conducted in seven divisional areas of Bangladesh. Data was collected for Five months periods from September 2020 to January 2021. This cross-sectional study was carried out at a variety of private and governmental hospitals. The study included 300 individuals who had been on antirheumatic medicines for at least six months. Patient demographic details, prescribed drugs, adverse drug

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reactions, and use of complementary and substitute medicine were used to analyze the pattern of drug use.

**Results and Discussions:** The results of the study found that most of the patients are from 40 to 60 years of age. The number of drug prescribed ranges from 3 to 8, with an average of 6.1 medicines per prescription. The most used Disease-modifying antirheumatic drugs (DMARDs) were tofacitinib, glucocorticosteroids were prednisolone and NSAIDs were Aceclofenac group. None of these drugs were prescribed as generic names, rather proprietary names were used.

**Conclusion:** Most of the patients are treated with more than one drug to fight against arthritis. So the incidence of drug interaction should be observed carefully. Moreover, both the prescriber and patient should be aware of ensuring rationale use of drug.

**Keywords:** Rheumatoid arthritis; prescription; prevalence; treatment; survey.

1. **INTRODUCTION**

Rheumatoid arthritis is a chronic inflammatory disorder marked by polyarticular joint involvement and extra-articular symptoms [1] which affects more than 2 million Americans [2]. In industrialized countries RA affect 0.5-1% of adults [3]. The disease usually strikes within the ages of 30 & 55 and women are more likely than males to be affected in a female/male ratio of 2.5/1 [2,4]. Synovial inflammation, increasing bone deterioration, joint malalignment & disruption and resultant weakening of adjacent tissues & muscles are all symptoms of this disease [1]. It typically affects more than five joints on both sides of the body, with a preference for the tiny joint of the wrists, hands & feet [5]. The prevalence of rheumatoid arthritis in Bangladesh is 0.7% in rural areas, 0.4% in urban slums and 0.2 percent in urban affluent areas, respectively [6]. In Bangladesh, a WHO-ILAR-COPCORD study on reign of rheumatic disorder in the adult folk found that the point prevalence of musculoskeletal complaints was 26.1% and the lifetime prevalence was 32.2%, with a prevalence of 8.7% in the 15-24 years age group & 65.3% in the 65 and older age group [7]. A positive family history raises the risk of rheumatoid arthritis by three to five times, and twin concordance rates are higher, implying that genetic factors play a role in pathogenesis [8,9]. The heritability of rheumatoid arthritis is now believed to be 40-65% in seropositive cases, but only 20% in seronegative cases [10,11]. The cost of RA is high for individuals, their families, and society as a whole. RA can cause occupational impairment, defined as a complete interruption of employment, in between 51 and 59% of patients within a decade of beginning [12]. In today's world, the goal of treatment is to attain mitigation, or low disease activity if mitigation is not achievable due to long term disease or comorbidities. Treatment should focus on preventing joint degeneration and disability, as well as systemic manifestation including cardiovascular damage, which is best accomplished with a treat-to-target strategy that includes strict disease management [13].

Novel therapy approaches for RA have emerged in the last 30 years, including early diagnosis, intense management, and new medications. These new paradigms have improved patient outcomes dramatically, improving quality of life and minimizing joint injury. Currently, non-pharmacological therapies such as life style changes, physical & occupational therapy, and surgical approaches are used in the treatment of RA [3]. The treatment of RA has improved considerably as a result of advancements in pharmacologic therapy, and many patients can now achieve remission. These advancements are the result of improved scientific understanding of the disease as well as the development of new treatment medicines that target critical disease mediators more specifically [13]. The pharmacological treatments used in RA non-steroidal anti-inflammatory drugs (NSAIDs), glucocorticoids [3] and conventional synthetic disease modifying anti-rheumatic drugs (sDMARDs) like methotrexate, leflunomide, sulfasalazine, cyclosporine, hydroxychloroquine [14] & biological disease modifying anti-rheumatic drugs (bDMARDs) like infliximab, rituximab, adalimumab, abatacept, anakinra, certolizumab, entercept, tocilizumab) and targeted synthetic DMARDs (eg, baricitinib & tofacitinib) [3].

The availability of bDMARDs raised the ability to regulate disease activity, decreased the need for surgery, and raised work participation and quality of life in patients with RA [15]. If not treated properly, RA can cause long-term discomfort, deformity, and disability, resulting in significant personal and societal expenses [16].

The aim of this survey-based research was to investigate the drug use pattern in RA affected...
patients by the physicians practicing in both private and public hospital settings in different areas of Bangladesh.

2. MATERIALS AND METHODS

2.1 Study Design

The current survey-based research study was conducted in seven divisional areas of Bangladesh. Data were collected for Five months periods from September 2020 to January 2021. This prospective, observational study was carried out at a variety of private and governmental hospitals.

2.2 Study Population and Data Collection

This study’s study populations were chosen at random, although data was collected from them specifically. For the investigation of prescription patterns, the prescription 300 patients suffering from arthritis were evaluated for this study. Prescriptions were collected from different private and public hospitals (not more than ten prescriptions from a single institution) situated in the seven divisional cities of Bangladesh. The Department of Pharmacy, Jashore University of Science and Technology, is also assisting with logistics for this survey-based study. The human volunteers involved in this study did not use any hazardous agents & no samples were taken from them.

2.3 Development of Patient Data Entry Form

The data was collected using a self-designed data entry form that included the patients’ demographics, clinical diagnosis, and medical history.

2.4 Evaluation Parameters

The average number of drugs per prescription, the proportion of drugs prescribed by generic name, the percentage of prescription with DMARDs, the categories of DMARDs prescribed, and the average number of NSAIDs & Glucocorticoids per prescription were all assessed.

2.5 Selection of Patients

2.5.1 Inclusion criteria

Information about patients under treatment and their prescriptions as well as consultant physician's information were recorded.

2.5.2 Exclusion criteria

Prescriptions with incomplete information were excluded.

2.6 World Health Organization (WHO) Prescribing Indicators

WHO arranged a conference at Nairobi in 1985. The main purpose of the conference was to ensure the rationale use of drug. To assist in drug use study WHO developed some prescribing indicators which was finalized in 1992. The indicators include average number of drugs per encounter, percentage of drug prescribed by generic name, percentage of encounter with an antibiotic prescribed, percentage of encounter with an injection prescribed and percentage of drug prescribed from essential drug list or formulary [17].

3. RESULTS

A total of 300 prescriptions were evaluated. In 300 patients, total 1830 of different medicines were prescribed. The number of drugs prescribed ranges from 3 to 8, with an average of 6.1 drugs per prescription. The majority of the patients in the study were female, with 242 (80.67%), and male, with 58 (19.33%). None of the drugs were prescribed as a generic name rather proprietary (brand) names were used.

3.1 Demographic Characteristics of Patients

Patients aged 40 to 60 years old had the largest percentage of visiting doctors (81%) followed by those aged over 30 years (14%) and those aged below 30 years (5%) in the prescription indicated in Fig 1 and 2.

3.2 WHO Prescribing Indicators

3.2.1 Number of the dosage form in prescription

In this study, no injectable medicines were recommended for patients in the age categories of 25-30 and 30-40. However, 64 patients in the 40-60 age group have 80 (4.37%) injectable medications on their prescriptions. The overall number of capsules was 334 (18.25%) of the total medicine, while the total number of tablets was 1316 (77.38%).
3.3 Percentages of Antirheumatic Drug according to the Drug Categories

Among prescriptions, the total number of bDMARDs was 210 (11.47%), sDMARDs were 62 (3.38%), NSAIDs were 340 (18.59%) and glucocorticosteroids were 64 (3.5%) of the total drugs.

3.4 Percentages of Antirheumatic Drug According to the Number

In total, 210 prescriptions contained two antirheumatic drugs, accounting for 70% of the total prescriptions. Three antirheumatic drugs were found in 78 prescriptions, which was 26% of the total. More than three antirheumatic medicines were prescribed in 6 prescriptions, which was 4% of all prescriptions.

3.5 The Most Prescribed Antirheumatic Drug

Most common anti-arthritis drugs found to be prescribed in this study are summarized in the Table 2.

4. DISCUSSION

The present study was done at different public and private hospitals in Jashore. A total 300 patient's prescriptions were analyzed which were prescribed for the treatment of RA. The patients in this study were between the ages of 25 and 60 years old. When we analyzed the prescription, we found certain errors. Some information was not available at the time. The majority of the patients are over 40 years old (81%) and under 30 years old (5%). The study assumes that DMARDs are the most essential for the treatment of rheumatoid arthritis [18,19]. The use of DMARDs early & aggressively has improved the management and results of RA patients [20]. According to multiple studies, many persons with RA are not reaping the potential benefits of DMARDs because they are underused [21]. Rheumatologist have used DMARDs to described treatments that interfere with the disease process that leads to RA & impact the diseases natural course [22]. DMARDs limit joint degeneration, slow the acute phase response, lower autoantibody levels, and have long-term functional effects that go behind those of symptomatic medications [23]. This study showed that bDMARDs & sDMARDs are used for the treatment of RA and the most used drug was bDMARDs. Glucocorticoids and NSAID are also used for the treatment of rheumatoid arthritis.

For the treatment and inflammatory control, NSAIDs and oral, intramuscular, or intraarticular corticosteroids may be used in the treatment of RA. NSAIDs and corticosteroids should be used solely for short-term relief. The treatment of choice is DMARDs [24].

WHO strongly recommends prescribing by generic name as a patient safety precaution since it clearly identifies the prescription, allows for improved information interchange, and improves communication between healthcare providers [25]. Our research found that no medications were prescribed by generic name, and that the prescribers were not aware of the significance of generic names. The rate of generic prescribing was higher in other developing country.
Table 1. Assessment of who prescribing indicators

| Characteristics                                      | Value |
|------------------------------------------------------|-------|
| Total number of prescriptions                        | 300   |
| Total number of drugs prescribed                     | 1830  |
| Average number of drugs per prescriptions            | 6.10  |
| Percentage of drugs prescribed by generic            | 0.00  |
| Percentage of patients encounters with antibiotics prescribed | 0.00  |
| Percentage of patients encounters with an injection prescribed | 8.5%  |

Table 2. Anti-arthritic drugs prescribed

| Name of the drug            | No. of prescription | Percentage (%) |
|-----------------------------|---------------------|----------------|
| bDMARD (total number 210)   |                     |                |
| Tofacitinib                 | 142                 | 67.62          |
| Upadacitinib                | 56                  | 26.27          |
| Tocilizumab                 | 10                  | 4.76           |
| Adalimumab                  | 2                   | 0.95           |
| sDMARD (total number 62)    |                     |                |
| Sulphasalazine              | 38                  | 61.29          |
| Methotrexate                | 12                  | 19.35          |
| Leflunamide                 | 8                   | 12.09          |
| Hydrochlorquine             | 2                   | 3.22           |
| NSAID (total number 340)    |                     |                |
| Aceclofenac                 | 98                  | 28.82          |
| Naproxen                    | 78                  | 22.94          |
| Diclofenac                  | 62                  | 18.23          |
| Tramadol hydrochloride      | 48                  | 14.11          |
| Others                      | 54                  | 15.88          |
| Glucocorticosteroid (total number 64)                |                     |                |
| Prednisolone                | 34                  | 53.13          |
| Methylprednisolone          | 16                  | 25             |
| Others                      | 14                  | 21.88          |

5. CONCLUSION

According to the findings of this study, prescribing procedures are frequently overused, and expensive kinds of drug therapy need to be properly supervised. In this investigation, the pattern of prescribing drugs was typically unsatisfactory. For some medicines, drug use patterns should be evaluated whether they were appropriately prescribed or not. Polypharmacy was discovered to be a concern in this study, as did the lack of generic prescribing. In this study, it was discovered that RA patients had little awareness of their disease. Patient’s knowledge can then be improved by formal training by health professionals and media-based educational programs.

CONSENT AND ETHICAL APPROVAL

Prior consent was taken from the patients before collecting information from their prescription.

This study was conducted in conformity with the general principles of the World Medical Associations Declaration of Helsinki (section 12). The Institutional Review Board of the Faculty of Health Sciences at Jashore University of Science and Technology provided ethical approval for this work. The District Medical Officer of Jashore, as well as the management of the health care facilities, provided administrative clearance.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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