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PREVALENCE AND PRESCRIBING PATTERN IN ORTHOPAEDIC DEPARTMENT AT A RURAL HOSPITAL SET UP - A PROSPECTIVE OBSERVATIONAL STUDY

Dr. P. Kishore[1]*, K. Prathyusha[1] and Dr. K. Ramesh[2]

[1]Department of Pharmacy Practice, Care College of Pharmacy, Warangal, Telangana, India.
[2]Consultant Orthopaedic & Spine Surgeon, R.R. Life Line Hospital, Nizamabad.

***Corresponding Author: Dr. P. Kishore**

Department of Pharmacy Practice, Care College of Pharmacy, Warangal, Telangana, India.

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ABSTRACT

Aim: To study the prescribing patterns and prevalence of disorders in Orthopaedic department at a rural set up. **Methodology:** A prospective observational study was conducted in the outpatient department of Orthopedics in Nizamabad. This study was conducted for a month from May 1st to May 31st. Patients who are willing to participate in the study; falling between the age group 1-90yrs were considered. Total 501 prescriptions were collected from the patients and analyzed. **Results:** In the study population, 234 [46.7%] were male and 267 [53.3%] were female. In our study we found that 194 patients were suffering with major types of arthritis like osteoarthritis, polyarthralgia and rheumatoid arthritis. The commonly prescribed drugs are calcium supplements/multivitamins [28.3%]; analgesics [26.2%], proton pump inhibitors [20.2%], NSAID's [26.2%], antibiotics [5.3%] and corticosteroids [2.9%]. Other drugs like DMARD's [1.6%], anxiolytic agents [0.2%], sedatives [2.1%] and enzymes like glucosamine, trypsin [3%] etc., were also prescribed in our study patients. **Conclusion:** Female patients were predominant in the study. Of all age groups, 40-90yrs patients were mostly suffering from arthritis. Of all NSAIDs, we found aceclofenac & paracetamol combination drugs are most preferred in treating osteoarthritis. For the treatment of osteoarthritis, topical and parenteral analgesics are preferred over symptomatic slow-acting drugs. Physiotherapy plays a major role in orthopaedic department, about 60% of the disorder is treated with drugs and remaining 40% are treated with physiotherapy. For manageable cases instead of using NSAIDs, physiotherapy, cold and heat therapy, aroma therapy and oil massage can be used to relieve pain.

KEYWORDS: Orthopedics, OA-Osteoarthritis, Analgesics, Anxiolytics.

INTRODUCTION

Orthopedics: Orthopedics is a branch of surgery broadly concerned with the skeletal system. This branch also includes various disorders related to bones, tendons, ligaments etc.[1]

A prescription by a doctor may be taken as a reflection of physicians' attitude to the disease and the role of drug in its treatment.[2] It also provides insights into the nature of health care delivery system. Many new drugs are available which have made it possible to cure or provide the symptomatic control of many clinical disorders, but in most of the circumstances drugs are not used rationally for optimal benefits and safety. To improve the overall drug use, especially in developing countries, international agencies like World Health Organization (WHO) and International Network for Rational Use of Drugs (INRUD) and Associations such as World Health Assembly, National Drug Policy, American association of orthopedics etc., provided treatment guidelines for better therapeutic benefit to the patients. Analyzing the pharmaceutical prescribing practices by health providers is one of the three drug use indicators [prescribing practices, patient care, facility-specific factors] developed to measure the rational use of drugs.[3] So, this study is conducted as an attempt to know the prevalence and pattern of disease and also prescribing practices in orthopedic department.

METHODS AND MATERIALS

This study was conducted in the ORTHOPAEDIC department at a private hospital, Nizamabad for the period of one month i.e.; from May 1st –May 31st. Data was collected from the out-patient cards of the patients visiting the hospital. Patients who are between the age group 1-90yrs and currently diagnosed with the disease with or without co-morbidities were included. Patients who are pregnant and suffering from carcinoma were excluded. The prescriptions were collected from the patients and were analyzed based on the following parameters in a specially designed data collection forms / profile forms.

1. Demographic data of the patient.
2. Category of the drugs used in the treatment.
3. Type of therapy: monotherapy or combination therapy.
4. Prevalence of disorders and prescription pattern.

5. Prevalence of different types of arthritis in different age groups.
6. Prevalence of different disorders in different age groups.

RESULTS

A total of 501 patients were included in the study and their prescriptions were analyzed. Among them 234 [46.7%] were male and 267 [53.3%] were female. Age wise distribution is shown in fig: 1.

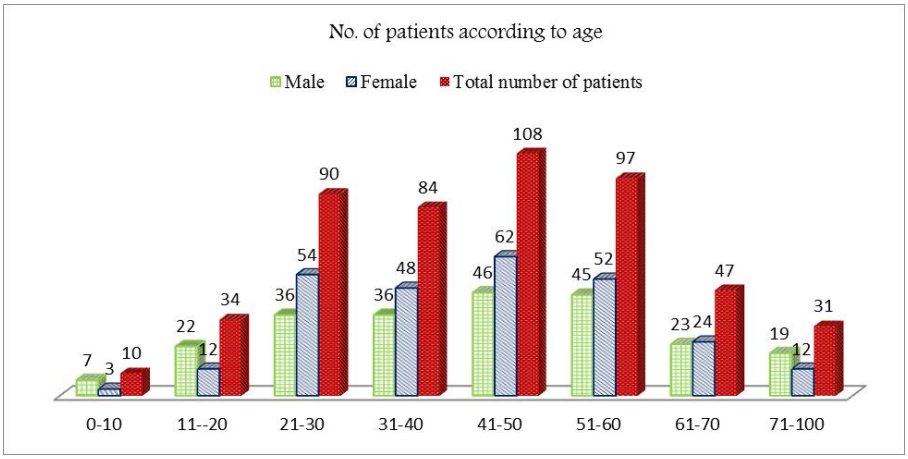

Fig. 1: Details of age distribution.

The below table shows the prevalence of diseases in our study site. Majority of the patients are suffering from OA followed by fractures, polyarthritis, and low backache as shown in the table-1.

Table. 1: Prevalence of disease.

S. No	Condition	Number of patients (males)	Number of patients(females)	Total number of patients	%
1	OA	32	58	90	17.9
2	Fractured cases	60	21	81	16.1
3	PA	29	34	63	12.5
4	Low back ache	8	20	28	5.5
5	Arthritis+psoriatic arthritis	14+1	13+0	28	5.5
6	Spondylitis +spondylolisthesis	7+0	17+2	26	5.1
7	Radiculopathy	9	17	26	5.1
8	Sprain	15	11	26	5.1
9	PA with RA	6	16	22	4.3
10	OA with PA	3	12	15	2.9
11	Tenderness & pain	10	4	14	2.7
12	Plantar fasciitis	4	7	11	2.1
13	Post-operative cases+ Injuries	5+0	0+5	10	1.9
14	Neuralgia	5	5	10	1.8
15	Tetany	3	5	8	1.5
16	Sciatica pain	3	3	6	1.1
17	Dequervain syndrome	2	3	5	0.9
18	Amputation+pericutaneous growth	4+0	0+1	5	0.9
19	Sudeck's dystrophy	3	2	5	0.9
20	Fibrositis +synositis	0	2+2	4	0.7
21	Spastic paraparesis	3	1	4	0.7
22	Ankylosing spondylosis	3	0	3	0.5
23	Cellulitis	1	1	2	0.3
24	Reter's syndrome	2	0	2	0.3
25	RA	0	2	2	0.3
26	OA with RA	0	2	2	0.3
27	Gouty arthritis	1	0	1	0.1
28	Dislocation of joints	1	0	1	0.1
29	Brachial hemialgia	0	1	1	0.1

The below table-2 describes the prevalence of various diseases at different age groups. At the age of 0-30 yrs, 31-40yrs, 41-90yrs majorly observed diseases are fractures, polyarthritis and osteoarthritis respectively as shown in the table-2.

Table. 2: Prevalence of diseases at various age groups.

Condition	0-10yrs	11-20yrs	21-30yrs	31-40yrs	41-50yrs	51-60yrs	61-90yrs
Sprain	6	1	6	4	2	4	3
Fracture	2	20	15	12	14	8	11
Dislocation	1	0	0	0	0	0	0
Percutaneous lengthening	1	0	0	0	0	0	0
Neuralgia	0	1	3	0	2	0	4
Tender	0	3	3	2	1	3	3
Arthritis	0	3	6	2	10	4	1
Radiculopathy	0	1	5	5	9	5	2
OA	0	1	10	15	19	24	20
Fibrositis/synositis	0	2	0	0	1	1	0
Amputation/post OP	0	0	3	2	0	0	0
PA	0	0	10	18	13	15	12
Spondylosis	0	0	3	4	5	4	7
Tetany	0	0	1	1	3	1	1
LBA	0	0	10	5	6	4	5
Plantar fascitis	0	0	7	1	9	1	0
Reters dystrophy	0	0	1	0	0	1	0
Spastic paraparesis	0	0	1	1	1	1	0
Traumatic injury	0	2	1	0	4	2	0
Sudecks dystrophy	0	0	1	2	1	0	1
Brachial hemialgia	0	0	1	0	0	0	0
PA with RA	0	0	3	5	3	7	4
OA with PA	0	0	0	2	7	3	2
Gouty arthritis	0	0	1	1	0	0	0
Sciatica	0	0	0	1	2	2	1
Dequarinvain syndrome	0	0	0	1	1	2	1
OA with RA	0	0	0	0	1	3	0
Cellulitis	0	0	0	0	1	1	0
Psoriatic arthritis	0	0	0	0	0	1	0
RA	0	0	0	0	0	1	1

At our study site, majority of the patients are suffering from OA, PA, RA, and OA with PA, OA with RA and PA with RA as shown in the fig: 2.

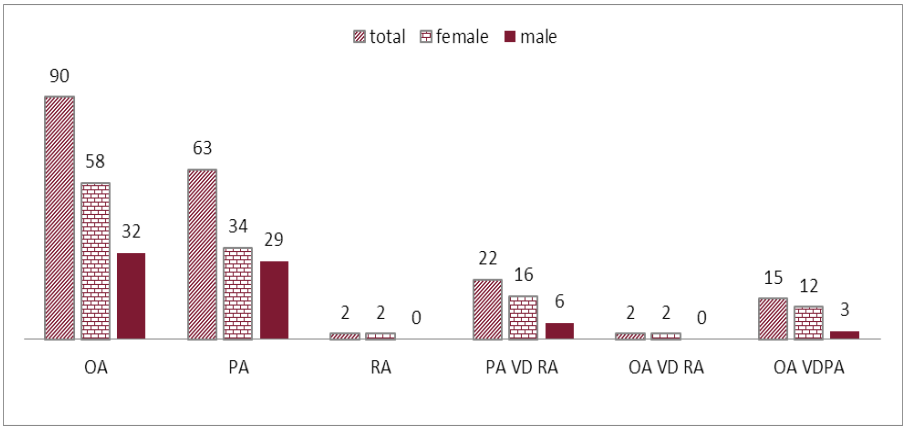

Fig. 2: Details of disease prevalence (arthritis) - Gender wise classification.

OA: Osteoarthritis. PA: Polyarthralgia. RA: Rheumatoid arthritis.
PA VD RA: Polyarthritis with Rheumatoid arthritis. OA VD RA: Osteoarthritis with Rheumatoid arthritis.
OA VD PA: Osteoarthritis with Polyarthritis

Details of Drugs prescribed: Drugs plays a key role in the health care system, they are administered to prevent, cure, diagnose and mitigate diseases and to improve patient's Quality of life.

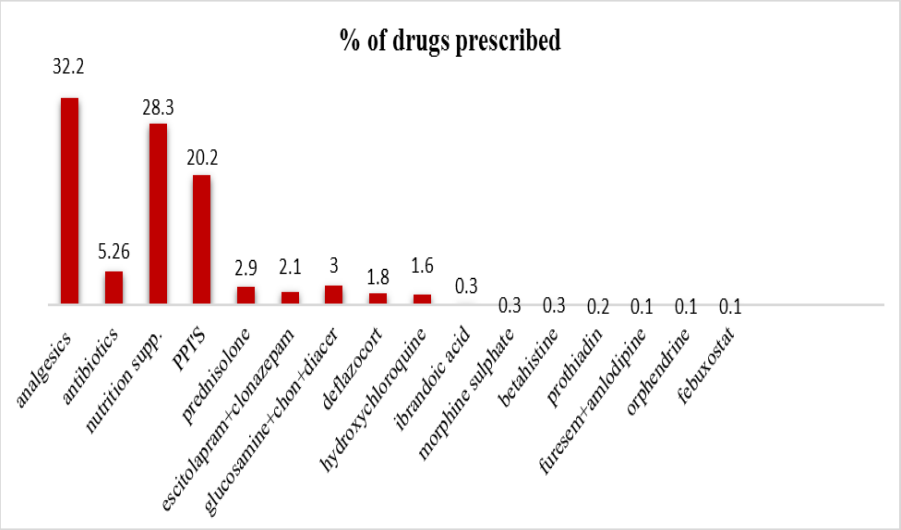

Fig. 3: Drugs prescribed by the Clinician.

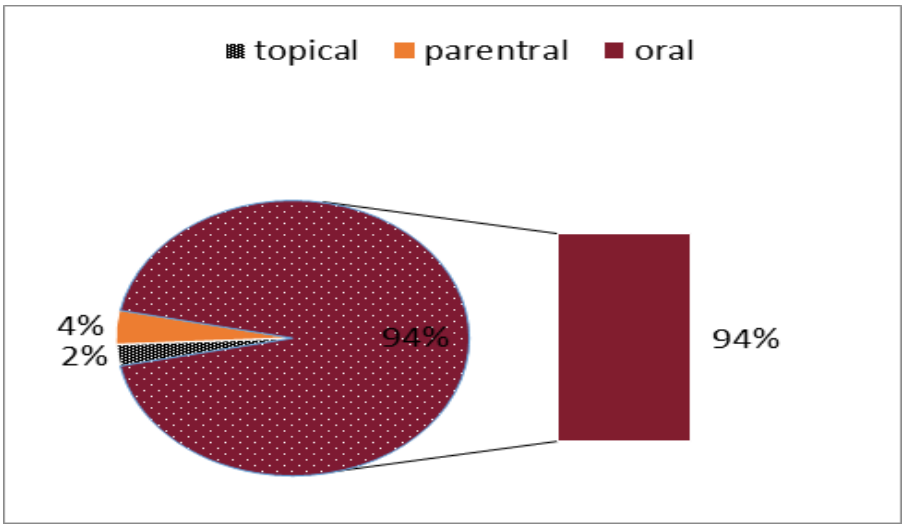

Fig. 4: Details of route of administration.

DISCUSSION

The study was conducted in an outpatient department for a period of one month and the 501 prescriptions were collected. In our study we observed that 90% of the prescriptions contain all demographic details of the patients. Among 501 patients, 53% [267] of the patients are female and 43.7% [234] are male. The disease (all disorders) prevalence rate in orthopedic department is high between the age group 41-50yrs, as age increases wear and tear increases and results in joint pains and degenerative problems such as OA, RA. In our study female patients are majorly suffered might be due less calcium intake and hormonal problems [i.e., as age increases menopause and increased risk of osteoporosis, OA is seen]. Highest percentage of male patients fall under the age group 40-60yrs, female patients in the age group 41-50yrs.

When compared with a study conducted by Taruna Sharma in Uttaranchal [Dehradun], prevalence of disorders according to age wise is as follows.[3]

Table. 3.

	A study in Dehradun, Uttaranchal[3]	A study in Nizamabad
Age group	**Percentage**	**Percentage**
0-18	0	8.77
18-30	32	17.96
31-49	38.3	38.31
50-69	22	28.74
70-90	7.6	6.18

Patients who visited hospital were majorly diagnosed with osteoarthritis. Of 90 OA patients, 32 are male and 58 were female. It might be because of hormonal changes, decreased levels of calcium and increased risk of osteoporosis. Fractures (81) were the next major cases

and then polyarthritis has its place, 63 patients were diagnosed with PA as described in table: 1.

At the age group 0-10yrs, soft tissue injuries [sprains] are the majorly diagnosed cases because it is common in children to fall and get injuries as they play and between age group 11-30yrs fractures are the mostly seen. It might be because of increased physical activity and road traffic accidents. Among 31-40yrs age group, patients are majorly suffering from polyarthritis and at the age of 40-90yrs majority of the patients are suffering from osteoarthritis. It might be because, as the age increases tissue degeneration takes place resulting in joint pains [arthritis].

The cause of OA is not yet known, but certain factors increase the risk of developing OA are heredity, overweight/ obesity, joint injury, repeated over use of certain joints, lack of physical activity, nerve injury, aging.[4]

At our study site, the cause of osteoarthritis in female patients is calcium deficiency and hormonal imbalance. OA is more frequently observed in female patients and at the age-group 30-60yrs. In male patients OA is due to lack of exercise and sudden increase in body weight because the incidence of hereditary related problems are less. Aging is not considered as major cause because this disorder is prevalent in age groups between 30-60yrs.

Traditionally diagnosis was done based on the blood tests, X-ray, MRI and RF-factor [rheumatoid factor], C-reactive protein [CRP] for rheumatoid arthritis. Mainly for fractures and sprains, diagnosis was done by radiological techniques such as X-rays and MRI as basis, but at our study site for osteoarthritis and rheumatoid arthritis, majorly physical examination is considered. As for these disorders not only X-rays and MRIs provide correct/appropriate support for diagnosis but there are other tests for conformation of the disease. For RA, suspected patients are advised to undergo rheumatoid factor test but it was found negative for majority of patients in early stages of RA. To evaluate the normal functioning of the joints specific tests like spring test, weight bearing tests etc. are done by the physician.

For Soft tissue injuries patients were complaining that it is due to accidental fall while playing and the reasons for fractures were slipping and road accidents. These disorders were more prevalent among the age-group above 20yrs.

Women are more prone to arthritic type of disorder like Osteo-Arthritis, Rheumatoid Arthritis along with polyarthritis as described in Fig: 2.

Our study revealed that average drugs per prescription were 6.7. Total numbers of drugs prescribed are 3324 when compared to 796 drugs prescribed in a tertiary hospital in Uttaranchal, [Taruna Sharma et.al.,][3] and 193 drugs prescribed in Gulbarga Hospital, [Mohamed Ahmed et.al.,].[5] In a study conducted in Mumbai [S.R. Gawdel et.al.,], [6] it was found that the average number of drugs per prescription was 6.17 and found out that only 35% drugs were prescribed by their generic name and the remaining 65% were in brand name. Drugs which are dispensed from the hospital pharmacy were only 49%,[7] but in our study it was found that 100% of drugs were prescribed with their brand names and 90% of the drugs were dispensed from the hospital pharmacy.

Commonly prescribed drugs were calcium supplements/multivitamins [28.3%]; analgesics [26.2%] and proton pump inhibitors. PPIs were prescribed as gastro protective agent to prevent increased secretion of hydrochloric acid due to concurrent use of NSAID's and antimicrobial agents. As described in the Fig:3.

Antibiotics are prescribed 5.2% and corticosteroids-2.9%. Other drugs like DMADA's, anxiolytic agents, sedatives, and enzymes like glucosamine, trypsin etc. were also prescribed in our study patients.

When compared to prescription pattern followed in Gulbarga [Mohamed Ahmed][5], most prescribed analgesics are Diclofenac [72(37.30%)] followed by Paracetamol [40(20.72%)], Aceclofenac [9(4.66%)].[5] But in our study most prescribed drugs were Aceclofenac followed by Paracetamol, Diclofenac and Tramadol.

In a study conducted in Mangalore [Ullal SD et.al,], it was found that in the treatment of osteoarthritis, NSAIDs, especially oral Diclofenac is the most preferred drug. Paracetamol, SYSADOA [symptomatic slow acting drugs for osteoarthritis] and topical NSAIDs are being under prescribed.[7] In our study we found that oral NSAID aceclofenac is the most preferred drug followed by prednisolone, SYSADOA and topical NSAIDs [Diclofenac] considering their toxic profile, efficacy and cost effectiveness.

In our study, Usage of analgesics, hydroxylchloroquine and prednisolone was 26%, 1.6% and 2.9% respectively compared to analgesics-62%, hydroxychloroquine-6.73% and prednisolone-3.62% in a study conducted at Gulbarga by Mohamed Ahmed.[5] This reveals that, the usage of hydroxychloroquine and prednisolone is more compared to our hospital, because of higher patient volume in RA, OA, gouty arthritis and septic arthritis in their hospital.

In our study we found that escitalopram in combination with clonazepam was prescribed more often compared to a study conducted by Shaikh Ubedulla et.al., in Nigeria, where in benzodiazepines such as Diazepam, Bromazepam, Lorazepam, Flunitrazepam, Nitrazepam were prescribed in 70.36%, 23.63%, 2.96%, 1.78 % and 1.27% respectively.[8] In Africa [Girish et.al,],[12] Diazepam, Bromazepam and Lorazepam were used because of their low affordability of the population. The

prescription pattern of Deflazacort [1.8%] in our hospital was almost similar to that of in Gulbarga [Mohamed Ahmed] 1.36%.[5]

The percentage of muscle relaxants prescribed in our hospital is 2.1 low compared to muscle relaxants prescribed in Khammam [Shaikh Ubedulla et.al,] 7.31%. Only 5.26% of anti-microbial drugs were prescribed in our study compared to treatment pattern of neighboring district like Khammam i.e., 15.62%.[9] This states that in Khammam the usage of skeletal muscle relaxants and antibiotics were more compared to our study. This might be because of high incidence of soft tissue injuries and hospital acquired infections.

Antimicrobials and NSAIDs were prescribed pre operatively to relieve pain and to treat various infections & post-operatively. In our study 100% of the antibiotics prescribed were in tablet dosage forms compared to a study reported from South India[10] where in 36% of antibiotics were prescribed by the parenteral route.

Appropriate selection of antibiotic and route of administration is dependent on the patient symptoms, clinical examination and culture/sensitivity results. The average number of drugs per prescription is an important index of a prescription audit.[11] It is safe to contain a prescription with less number of drugs to prevent toxicity and drug-drug interactions, and to prevent tolerance. When prescription pattern of our study is compared with the prescription pattern of Mumbai the result was as mentioned below.[10]

Table. 4: Comparison of category of drugs between Nizamabad and Mumbai regions.[10]

Category of drugs	Nizamabad	Mumbai
NSAIDs	26.2%	48.19%
Anti-ulcer drugs/PPIs	20.9%	30.58%
Skeletal muscle relaxants	2.1%	3.58%
Multivitamins & minerals	28.3%	15.89%
Others [antibiotics, anti-gout, enzymes; Gels; injections etc.]	22.5%	1.76%
Total	100%	100%

In the study conducted in Mumbai, it was found that in treating rheumatoid arthritis combination therapy is mostly preferred[6] such as

- Two DMARDs: Methotrexate + Hydroxychloroquine.
- Sulfasalazine + Hydroxychloroquine
- Methotrexate + Sulfasalazine.
- Three DMARDs: Methotrexate + Hydroxychloroquine+ Sulfasalazine.
- Methotrexate + Hydroxychloroquine +Leflunomide

But in our study we found that only monotherapy was preferred at our study site such as glucosamine, hydro chloroquine.

Table. 5: Prevalence of disorders in Nizamabad district compared to that with Khammam district is as follows.[9]

Condition	Nizamabad	Khammam
Fractures	16%	54%
Spondylosis	5%	20%
Osteoarthritis	17%	6%
Dislocations	0.1%	4%

In our study we found that total 194 patients were suffering with major types of arthritis like Osteoarthritis, Polyarthralgia and rheumatoid arthritis where as in Gulbarga [Mohamed Ahmed et.al,] it was found to be only 92 were suffering.[5] This comparison states that prevalence of arthritis is more in South India than in Gulbarga.[5]

Table. 6: Prevalence of rheumatoid arthritis (RA) in some developing countries.[12]

Country	Percentage of disorder
Pakistan	0.551
Argentina (Tucuman)	0.19
India	0.52
Mexico	0.30
China (Shanghai 1998)	0.47
Brazil	0.46
Iran (urban)	0.37
China (Shantou)	0.32
Indonesia (urban)	0.3
Vietnam	0.28
Egypt	0.29
Indonesia (rural)	0.22
Lesotho	0.03
Philippines (rural)	0.23
China (Shanghai)	0.24
Philippines (Urban)	0.175
South Africa (rural)	0.675
South Africa (rural)	0.1
South Africa (urban)	0.90
Malaysia	0.15
Thailand	0.12

In the United States, an estimated 1.5 million people have RA and there are 2.5 times as many women as men with the disorder.[11] In our study area we found only two female patients were suffering from RA.

CONCLUSIONS

1. This type of study will help us to understand the prevalence of various disorders and prescription pattern in the orthopaedic department and the category of drugs used in practice to treat the disorder/condition.

2. In patients age ranging from 40-90yrs, arthritis is more common disorder. Of all NSAIDs, we found that aceclofenac & paracetamol combination is the most preferred one in treating osteoarthritis.

3. We found that in the treatment of osteoarthritis, topical and parenteral analgesics are preferred over symptomatic slow acting drugs [glucosamine, Chondroitin and Diacerein].

4. Usage of anxiolytic agents alleviate patients from anxiety, insomnia & muscular disorders and also reduce the complaints regarding pain due to fibromyalgia, RA, ligament injuries.

5. Only minor drug-drug interaction and drug-food interaction were found in prescriptions.

6. Aceclofenac is the mostly prescribed drug in the orthopaedic department than other analgesics like Diclofenac, Tramadol [non selective NSAIDs] along with a proton pump inhibitor [pantoprazole/rabeprazole].

7. Proton pump inhibitors like pantoprazole and rebeprazole are used as gastro protective but pantoprazole are mostly preferred than rebeprazole because it is low cost compared to rabeprazole.

8. Patient counseling was done for maximum number of patients [98%]. The patients of subsequent visits were not counseled because, they were already provided with the information regarding life style modifications, drug administration and physiotherapy.

9. Physiotherapy plays a major role in orthopaedic department, about 60% of the disorder is treated with drugs and 40% is used to treat with physiotherapy. In OA and fractured cases physiotherapy is mandate for the complete treatment. In elder people it plays a major role to bring back the normal functioning of the joints.

10. For manageable cases instead of using NSAIDs, physiotherapy exercises, cold and heat therapy, aroma therapy and oil massage can be used to relieve pain.

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