



A Cross Sectional Study to Analyze Drug Utilization Pattern of Pain Clinic in a Tertiary Care Hospital of Central India

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ABSTRACT

Background: Pain is associated with increased prevalence of chronic diseases which adversely affects the quality of life of patients. This also leads to increased demand of drugs for chronic pain relief. Drug utilization pattern studies of pain clinic are therefore important to ascertain rational use of medicines in healthcare system. The study aims to evaluate drug utilization pattern in pain clinic of a tertiary care teaching hospital.

Methods: A cross sectional study was done by analyzing prescriptions of patients at pain clinic of MYH Hospital of Indore, MP, India, for a period of 3 months from November 2021 to January 2022. Total 260 prescriptions were analyzed on the basis of WHO core prescribing indicators, FDC (Fixed Dose Combinations) & NLEM (National List of Essential Medicines) list by using descriptive statistics.

Results: Study results showed that analgesics were most commonly prescribed in the age group 41-60 years. Lower back pain (28.8%) was the most common indication for prescribing analgesics in pain clinic with a female preponderance of 57.7%. Out of total 639 drugs, Fixed Dose Combinations (FDC) (76.2%) were more than single drugs (24.8%). 59.3% of drugs were concomitant medications. 80% (220) FDCs were generic and Gabapentin+Nortryptiline (31.8%) was the commonest FDC. Pregabalin was the most commonly prescribed single drug preparation. Average number of drugs per encounter were 2.45 and generic prescribing was 85.7%. Total 46% of medicines were prescribed from NLEM.

Conclusion: We found that FDC, generic prescribing and concomitant medications use was higher in our study. The study guides for rational prescribing of analgesics to maximize pain relief and minimize adverse effects associated with it.

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Introduction

“Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”(1). “Pain is always subjective”, (2) that drives the patient to seek medical care. It can be acute or chronic in nature. Acute pain is an indicator of some underlying pathology and serves a useful biological purpose. Chronic pain is defined as “pain without apparent biological value that has persisted beyond the normal tissue healing time usually taken to be 3 months”(3). The prevalence of chronic pain among Indian adults is around

19.3% with female preponderance (4). Various causes of chronic pain include cervical radiculopathy, joint pain secondary to arthritis, neuralgia and other neuropathic pain states, backache, musculoskeletal pain, pain associated with psychosomatic disorders etc.

Moreover, due to an increase in the prevalence of Chronic diseases, chronic pain associated with these ailments, adversely affects the quality of life of the patient. Therefore effective pain management is an essential component of care of such patients in pain clinics.

Pain clinics comprises of a multidisciplinary unit in which

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clinicians from different specialties like anesthesiologists, neurologists, physical medicine and rehabilitation specialists, psychologists, physical therapists and acupuncturists work in co-ordination to help patients suffering from different painful conditions.

Analgesics are commonly used in pain clinics for pain relief. There is a wide range of analgesics which span across many drug classifications like: - Opioids, Non-steroidal anti-Inflammatory drugs (NSAIDs), drugs for neuropathic pain like anti epileptics, local anaesthetics, tricyclic anti-depressants etc. (5).

These drugs offer symptomatic benefit of pain relief without significantly affecting the underlying pathophysiology. Also, in order to provide adequate pain relief, these analgesics need to be consumed by the patient on a long term basis which may lead to adverse effects like tolerance and dependence from opioids,

hepatotoxicity & nephrotoxicity from NSAIDs, increased risk of polypharmacy and drug interactions among patients with comorbidities. These factors may collectively increase the financial as well as mental burden on the patients (6).

In this regard, drug utilization pattern studies provide a scope to identify more efficacious, safer & cost effective analgesics among patients with chronic pain. According to World Health Organization (WHO), a drug utilization study is about “marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences” (7).

No such study has been done in our institute in the past to the best of our knowledge. Hence, the present study was planned with the aim of improving the quality of prescription, reducing the adverse effects thereby promoting rational use of drugs.

Table 1. Drug utilization pattern was observed by using WHO core prescribing indicators(8) as follows

WHO core indicators	Pain clinic (n=260)	WHO standard value
Average number of drugs per encounter	2.45 (Mean=2.125, SD= 0.45962)	1.6-1.8
Percentage of medicines prescribed by generic name	85.7%	100%
Percentage of encounters with an antibiotic prescribed	00	20.0-26.8
Percentage of encounters with an injection prescribed	00	13.4-24.1
Percentage of medicines prescribed from NLEM (National List of Essential Medicines).	46% (294)	100% (639)

Methods

This was a cross sectional observational study conducted at Pain Clinic of Maharaja Yashwantrao (M.Y.) Hospital, Indore, Madhya Pradesh, India after receiving permission from Institutional ethics committee. Prescription data of OPD (Out Patient Department) patients who attended pain clinic for the first time from November 2021 to January 2022 were included. Permission to access prescription data was taken from the clinician in charge of Pain Clinic. The procedure followed were in accordance with the ethical standards of the responsible committee and with the Helsinki Declaration of 1975. The drug prescription pattern was analyzed. Follow-up of prescription was not included. Data compilation and Statistical analysis were done in Department of Pharmacology, Mahatma Gandhi Memorial Medical College & M.Y. Hospital, Indore, M.P.

The parameters for analysis included demographic characteristics age and gender distribution and provisional diagnosis of their illness. Drug utilization pattern was analyzed using WHO core prescribing indicators (8) which are as follows 1). Average number of drugs per encounter, 2). Percentage of medicines prescribed by generic name, 3). Percentage of encounters with an antibiotic prescribed, 4).

Percentage of encounters with an injection prescribed, 5). Percentage of medicines prescribed from NLEM (National List of Essential Medicines). Additionally, we also calculated percentage of generic and branded drugs among prescribed fixed dose combinations (FDCs) and single drug preparations.

Data of 260 written prescriptions were entered in MS excel sheet. Data was expressed in terms of mean, average & percentages & was analyzed using IBM SPSS Statistics Data editor Version 28.0.1.1(15) for descriptive statistics.

Results

Prescriptions of a total of 260 patients who attended pain clinic OPD for the first time were included and analyzed. Females (57.7%) outnumbered males in our study. The most common age group range visiting pain clinic was 41-60 years (44.2%) (Table 2).

Lower back pain (28.8%) was the most common indication for prescribing analgesics in pain clinic with a female preponderance of 57.7%. Neuropathic pain (11.5%), Cervical radiculopathy (10.3%), Plantar fasciitis (6.5%), Sciatica (5.7%) and Axial neck pain (5.7%) were other common indications. (Figure 1).

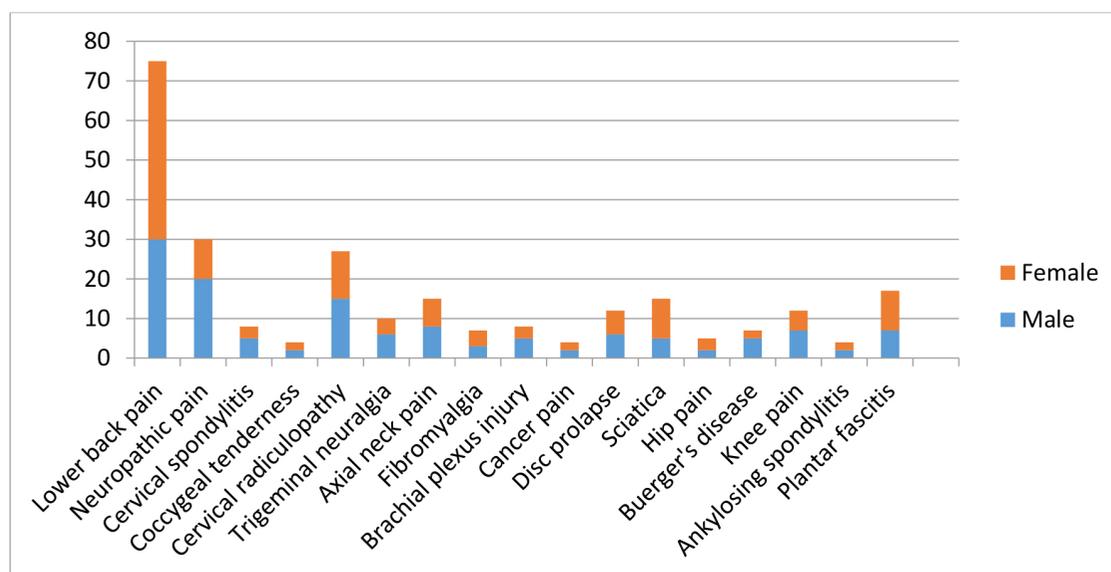


Figure 1. Indications of analgesic use in males and females.

Table 2. Age wise distribution of patients.

Age group	Number
<20	5(1.92%)
21-40	40(15.38%)
41-60	115(44.2%)
61-80	95(36.5%)
>80	5(1.92%)

Table 3. Percentage prescription of different drugs according to generic and brand form.

Name of drugs	Number of prescription	Generic form	Brand form
Gabapentin	10	8(80%)	2(20%)
Methylcobalamine	22	20(90%)	2(10%)
Diclofenac	1	1(100%)	0(0)
Paracetamol	3	3(100%)	0(0)
Ranitidine	56	50(89.2%)	6(10.8%)
Thiocolchicoside	8	5(62.5%)	3(37.5%)
Calcium	50	50(100%)	0(0)
Multivitamin	80	80(100%)	0(0)
Duloxetine	9	2(22.2%)	7(77.8%)
Pregabalin	16	14(87.5%)	2(12.5%)
Pantoprazole	87	79(90.8%)	8(9.2%)
Vitamin D	8	3(37%)	5(62.5%)
Ibuprofen	1	1(100%)	0
Carbamazepine	2	2(100%)	0
Deflazacort	1	1(100)	0
Baclofen	1	1(100)	0
Cilostazol	2	2(100)	0
Methadone	1	1(100)	0
Amitriptyline	3	3(100)	0
Tapentadol	2	2(100)	0
Etoricoxib	1	1(100)	0
Escitalopram	1	1(100)	0

Table 4. FDCs prescription in generic and brand forms.

Name of drugs	Number of prescription	Generic form	Brand form
Paracetamol+ Tramadol	32	12(37.5%)	20(62.5%)
Gabapentin+ Methylcobalamine	14	10(71.4%)	4(28.6%)
Pregabalin+ Methylcobalamine	32	22(68.75)	10(31.25%)
Diclofenac+PCM+Serratiopeptidase	18	18(100%)	0(0%)
Thiocolchicoside+Ketoprofen	8	3(37.5%)	5(62.5%)
Gabapentin+Nortriptyline	63	59(93.6%)	4(6.4%)
Aceclofenac+Serratiopeptidase	3	3(100%)	0(0%)
Calcium+Vitamin D	76	70(92.1%)	6(7.9%)
Pregabalin + Nortriptyline	28	23(82.1%)	5(17.9)
Total	274	220	54

A total of 639 drugs were prescribed in all the cases with predominance of Fixed Dose Combinations (FDC) (76.2%) over single drugs (24.8%). In this pain clinic, apart from analgesics, 59.3% of drugs were concomitant medications (Table 4).

The combination of calcium with vitamin D was most commonly prescribed FDC which is an adjuvant to analgesics. Among analgesics, Gabapentin + Nortriptyline (31.8%) was the commonest FDC followed by Paracetamol + Tramadol (16.1%), Pregabalin + Methylcobalamine (16.1%) and Pregabalin + Nortriptyline (14.1%). A total of 274 FDCs were prescribed out of which 80% (220) were generic and 20% (54) were prescribed with their brand name. Diclofenac + Paracetamol + Serratiopeptidase and Aceclofenac + Serratiopeptidase were prescribed completely (100%) as generic. Paracetamol + Tramadol (Ultracet)(62.5%) and Thiocolchicoside+ Ketoprofen (Myoril plus)(62.5%) were prescribed most commonly by their brand names (Table 4).

A total of 365 single preparation drugs were prescribed out of which 89.8% (328) were generic and 10.2% (37) were prescribed with their brand name. Pantoprazole was the most commonly prescribed drug among all the single preparation drugs (23.8%). Among analgesics, Pregabalin was the most commonly prescribed single form drug (4.38%) followed by Gabapentin (2.7%) and Thiocolchicoside (2.19%). Many drugs were prescribed completely as generic. Duloxetine (Dulot, Symbal etc.) were prescribed most commonly by its brand name (77.7%).

Discussion

Prescriptions of a total of 260 patients paying their first visit in pain clinic were included in the study and their prescriptions were analyzed. The most common age group attending pain clinic was in the range of 41-60 years with

a female preponderance. Earlier studies also recorded the same age group and higher percentage of females attending pain clinic as compared to males (4). In our study, majority of patients complained of Lower back pain. Also, neuropathic pain, cervical radiculopathy, plantar fasciitis, sciatica and axial neck pain were some other common indications for prescribing analgesics in our study. Other similar studies have also shown neurological cause as the main indication for prescribing analgesics (9) whereas some studies have shown no definitive provisional diagnosis for prescribing analgesics in majority of their prescriptions (10).

We found that a total of 639 drugs were prescribed out of which majority were FDCs (Fixed Dose Combinations) as compared to single drug preparation. Usually a single analgesic is prescribed for mild pain and combination of analgesics with different mechanisms are given to those with moderate to severe pain. Since there is an increasing trend of prevalence of chronic diseases with moderate to severe pain, this might be the cause of prescribing more FDCs in our study. Many previous studies have also shown that polypharmacy was common in pain clinic.

More than half of the drugs were either adjuvant drugs or concomitant medications to ameliorate the adverse effects of analgesics. It is quite evident from the findings that among the single drug preparations, Pantoprazole and among FDCs, Calcium with vitamin D were the most commonly prescribed non-analgesics in our study. A previous study done by Mohammad et al., also showed that anti-ulcer drugs were prescribed along with analgesics to reduce the gastric complications (11). Analgesics does not affect the underlying cause and progression of chronic diseases but definitely affords symptomatic relief and improves patient's quality of life. Also, analgesics may show some side effects if taken on a long term basis, gastrointestinal distress being the most common. To overcome this, anti-ulcer drugs are

the most common accompaniment of NSAIDs which may further increase the cost of treatment and financial burden on patients. Moreover, supplements like Calcium and vitamin D are widely prescribed with analgesic as most of the chronic painful conditions like back pain, arthritis etc. are also associated with calcium deficiency. These might be the probable reasons for our study findings.

In our study the most common analgesics prescribed were Gabapentin+Nortriptyline among FDC and Pregabalin among single drug preparation. Gabapentin and pregabalin are basically antiepileptic drugs that facilitates GABAergic transmission and are widely prescribed for treatment of neuropathic pain. Nortriptyline is a Tricyclic antidepressant (TCA) with property of Noradrenaline reuptake inhibition and is also commonly used against neuropathic pain.

We found that most of the drugs, FDCs as well as single drug preparations were prescribed as generic drugs. Diclofenac + Paracetamol + Serratiopeptidase and Aceclofenac + Serratiopeptidase combination and more than half of single drug preparations were prescribed completely as generic. One fifth of FDCs were prescribed by their brand names namely Paracetamol + Tramadol (Ultracet) and Thiocolchicoside + Ketoprofen (Myoril plus) whereas only one tenth of single drug preparations were branded, the most common being that of Duloxetine.

Generic prescribing is a priority policy issue as it cuts down the prescription costs and improves adherence to medication (12). Therefore it is important to encourage substitution of branded drugs with inexpensive clinically equivalent generic versions of such drugs.

Drug utilization pattern was observed by using WHO core indicators. In our study, the average number of drugs per encounter was found to be 2.45 which was greater than the WHO standard value of 1.6-1.8. This indicator signifies the extent of polypharmacy (12). The WHO proposes that ideally all medicines (100%) should be prescribed by generic name. We found that in our study 85.7% of medicines were prescribed by generic name. This indicator assesses the tendency of the prescriber to prescribe generic medicines. We did not find any of the prescriptions with antibiotics and injections as these drugs were not required to be prescribed in the pain clinic. 46% of medicines in our study were prescribed from NLEM (National List of Essential Medicines). Ideally all the medicines in the prescription should be prescribed from NLEM as it ascertains that all the medicines prescribed are cost effective and satisfies the priority health needs of the population.

Drug utilization pattern studies provide an insight into the rationality of prescribing. In our study, FDCs and generic prescribing was found to be greater whereas drugs prescribed from NLEM were much less than the ideal value suggested by WHO. Also, the use of concomitant medications and supplements was substantially higher with

the aim of curbing adverse effects associated with long term use of analgesics. In this regard, it is prudent to conclude that greater emphasis should also be given on primordial and primary prevention of chronic diseases responsible for various chronic painful conditions. This will provide better management of chronic pain and in turn will also lead to lesser economic burden on the patients as well as governments which may lead to proper allocation of limited health care resources.

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