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A STUDY ON DRUG UTILIZATION PATTERN OF ANALGESICS IN A TERTIARY CARE HOSPITAL

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Abstract:

Pain represents a complex experience which can be approached by various medicines. Opioid and non-opioid analgesics are the most common drugs used to manage different types of pain. Due to population ageing, there is an increase in the prevalence of chronic diseases, and in particular musculoskeletal diseases. These trends are associated with an increased demand for prescription analgesics and an increased risk of adverse reactions, which constitute a challenge especially for general practitioners.

The main objective is to evaluate the use of analgesics in a multi-specialty teaching hospital. The secondary goal is to determine the level of analgesic use in the hospital, to prevent inappropriate analgesic use.

A prospective observational study was done by analyzing the case records of patients prescribed with analgesics mainly in the departments of General Medicine, Neurosurgery, Orthopedic and Nephrology from Suraksha Hospitals, located in Guntur, Andhra Pradesh. The data collection study was conducted between October 2020 to March 2021. A study was done to find out the drug use rating of analgesics, which will allow us to find the rational use of analgesics in the given population.

The total number of 1115 patients was analyzed. The study results show that analgesics were most commonly prescribed in the age group of 40-49. Naproxen is the most commonly prescribed analgesic drug followed by Aspirin, paracetamol, diclofenac and aceclofenac. Commonly prescribed FDCs (fixed dose drug combinations) are flupiritine + paracetamol and diclofenac + metaxalone. Anti-depressant drug like paroxetine and anticonvulsant drug like gabapentin are commonly prescribed for neuropathic pain mainly in the Neurosurgery department. More severe pain is seen in spondylolisthesis followed by osteoarthritis, nerve damage (neuropathy), multiple fractures due to road traffic accident, collar bone ache etc.

Drug use issues are common and have vital clinical and economic implications. The support and involvement of medical staff is essential to the success of a DUE (drug utilization evaluation) program.

KEYWORDS: *Drug utilization, analgesics, pain, prescribing pattern.*

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INTRODUCTION:

According to World Health Organization (WHO) drug utilization study is about marketing, distribution, prescription and use of medicine during a society, with special emphasis on the resulting medical, social, and economic consequences. A DUR (drug utilization review) program is an intervention within the sort of licensed, structured, and ongoing system for improving the standard of drug use within a given health care institution [1].

Prescription pattern analysis is a part of drug utilization study; it improves the standard of prescription, reduces the adverse effects of drugs and enhances the rational use of medicine [2]. Irrational prescribing has become a worldwide issue from which developing countries are directly affected. Special knowledge and experiences are required for the utilization of certain drugs [3].

Pain is an unpleasant sensation occurring in varying degrees of severity as a consequence of injury, disease, or affective disorder. Poor pain control is unethical, clinically unsound and economically wasteful. The recent initiative of including pain as fifth sign in health care has emphasized pain assessment is equally important thereto of temperature, pulse, vital sign, and rate of respiration. Pain is usually subjective [4]. Pain is the main reason now-days that patients address healthcare services. The concept of pain relief as a person's right has gained more and more ground at a worldwide level to assist overcome the barriers against efficient pain management. Confronted with this trend, health professionals must have the knowledge regarding analgesics to assure an efficient and not the least safe pain treatment [5].

An analgesic or painkiller is any member of the group of drugs used to achieve analgesia, relief from pain [6]. When choosing analgesics, the severity and response to other medication determines the selection of agent; the World Health Organization pain ladder specifies mild analgesics as its initiative. Analgesic drugs act in various ways on the peripheral and central nervous system. A variety of so-called "analgesic adjuncts" have proven efficacy for managing chronic pain [7].

Analgesics are mainly classified into opioid and non-opioid analgesics. Opioid analgesics include Tramadol, Hydrocodone, Tapentadol etc. Non-opioid analgesics include non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol (acetaminophen). NSAIDs are further divided into non-selective traditional NSAIDs (tNSAIDs) and selective cyclooxygenase (COX)-2 inhibitors [8, 9]. Analgesic choice is additionally determined by the sort of pain: For neuropathic pain, traditional analgesics are less effective, and there's often benefit from classes of medicine that aren't normally considered analgesics, like tricyclic antidepressants and anticonvulsants [10]. Due to population ageing, there's a rise within the prevalence of chronic diseases, and especially musculoskeletal diseases. These trends are related to an increased demand for prescription analgesics, and an increased risk of poly pharmacy, and adverse medication reactions, which constitute a challenge, especially for general practitioners [11].

MATRIALS AND METHODS:

STUDY DESIGN

The current study was a prospective observational study of Analgesic patients presented to the departments of General medicine, Neurosurgery, Orthopedic, and Nephrology from Suraksha Hospitals, located in Guntur, Andhra Pradesh. The data collection for the study was conducted between October 2020 to March 2021. All the hospitalized patients of different departments who fulfill the inclusion criteria were included in the study period. A various demographic parameter such as age, weight, and gender were recorded. Medical record file of the patients was observed for the patient's diagnosis, comorbidities, current and previous medications after admission spe

cifically the analgesic medications. The analgesic drugs prescribed were also checked for the strength and dosage form of medications. The pattern of the medicines prescribed was also checked that whether the medicines were prescribed as a generic name or brand name.

Data on demographic parameters, drug prescription pattern and clinical profile was documented in structured proforma. The study was approved by institutional human ethics committee.

Inclusion criteria: The study has included all the adult's patients of age >18years who were prescribed with analgesics without any gender restrictions. Patients with all comorbid conditions like Diabetes mellitus, Hypertension, Thyroid, Obesity, Chronic ischemic heart diseases and Osteoarthritis were also included.

Exclusion criteria: All adult patients of age <18 years, patients who met hospital mortality, referred to high centers due to critical illness, pediatrics, pregnant women, mentally retarded, unconscious and comatose patients were excluded from the study. Improper or

incomplete information like diagnosis, type and drug related traits were also excluded from the study.

RESULTS:

Table 1: Demographic details –Gender wise distribution of male and female patients

S. No	Gender	Number of subjects (N= 1115)	Percentage (%)
1	Male	536	48.07
2	Female	579	51.92

The study results show that 48.07% are male and 51.92% are female. It means females are having high percentage when compared to the males.

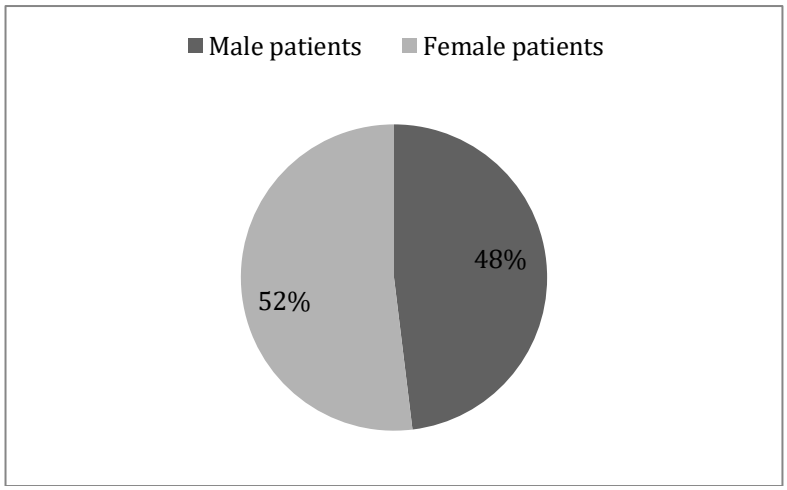

Figure 1: Gender wise distribution of Male and Female patients

Table 2: Demographic Details-Age wise distribution of patients

S. No	Age (in years)	No of Patients (N=1115)	Percentage
1	18-19	37	3.31
2	20-29	120	10.76
3	30-39	208	18.65
4	40-49	280	25.11
5	50-59	248	22.24
6	60-69	154	13.81
7	70-79	63	5.65
8	80-89	5	0.44

Age wise distribution of patients were analyzed and it was found that 3.31% of prescriptions were in the age group of 18-19 years, 10.76% in the age group of 20-29, 18.65% in the age group of 30-39, 25.11% in the age group of 40-49, 22.24% in the age group 50-59, 13.81% in the age group of 60-69, 5.65% in the age group of 70-79 and 0.44% in the age group of 80-89 years.

High percentage of analgesics was found in the age group of 40-49 and low percentage of analgesics was found in the age group of 80-89.

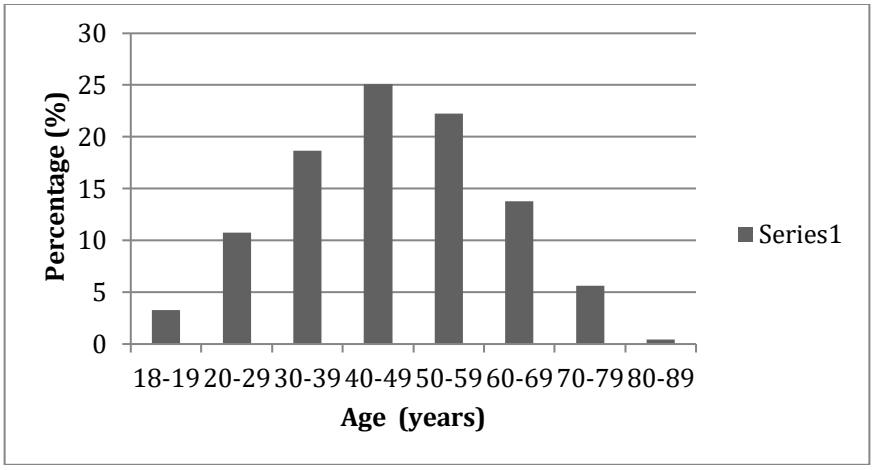

Figure 2: Age wise distribution of patients

Table 3: Opioid vs Non opioid drugs

S. No	Parameters	Number of drugs (N=2138)	Percentage (%)
1	Opioids	131	6.12
2	Non opioids	2007	93.87

The study results show that 6.12% are opioids and 93.87% are Non-opioids. Opioids was prescribed in fewer amounts when compared to non-opioids in case of out-patients but whereas in case of pre-operative patient's opioids are prescribed first and then shifted to non-opioids.

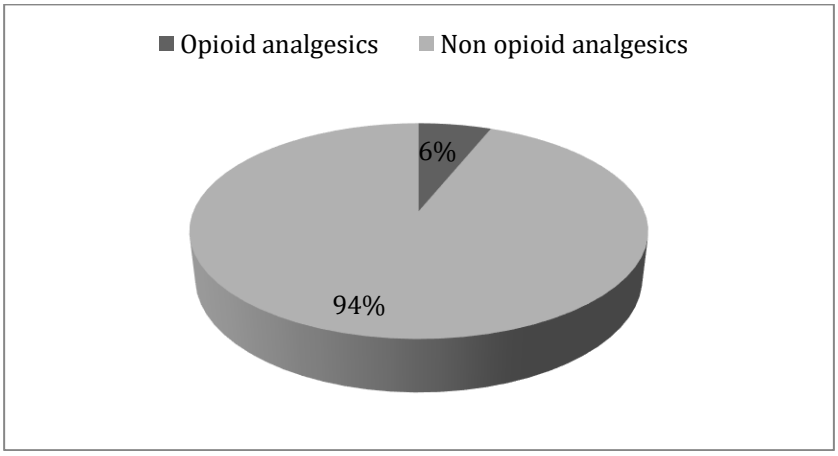

Figure 3: Opioid vs Non-opioid drugs prescribed in patients

Table 4: Category wise distribution of drugs

S. No	Category	No. of Drugs (n=2138)	Percentage (%)
1	NSAIDs	761	35.59
2	Anti-epileptic	379	17.72
3	Combination analgesics	348	16.27
4	Adjuvant analgesics	213	9.96
5	Opioid analgesics	131	6.12
6	Steroids	126	5.89
7	Aniline analgesics	67	3.13
8	Anti-depressants	51	2.38
9	Anti-inflammatory	16	0.74
10	Anti-spasmodic	13	0.60
11	Muscle relaxant	20	0.93
12	Topical analgesics	5	0.23
13	Anti-anxiety	7	0.32
14	Anti-psychotic	1	0.04

Category wise distribution of drugs were analyzed and it was found that 35.59% are NSAIDs, 17.72% are anti-epileptics, 16.27% are combination analgesics, 9.96% are adjuvant analgesics, 6.12% are opioid analgesics, 5.89% are steroids, 3.13% are aniline analgesics, 2.38% are anti-depressants, 0.74% are anti-inflammatory, 0.60% are anti-spasmodic, 0.93% are muscle relaxants, 0.23% are topical analgesics, 0.32% are anti-anxiety and 0.04% are anti-psychotic drugs.

NSAIDs are the drugs that are prescribing most commonly and it was found to be with high percentage when compared to all other categories of analgesics.

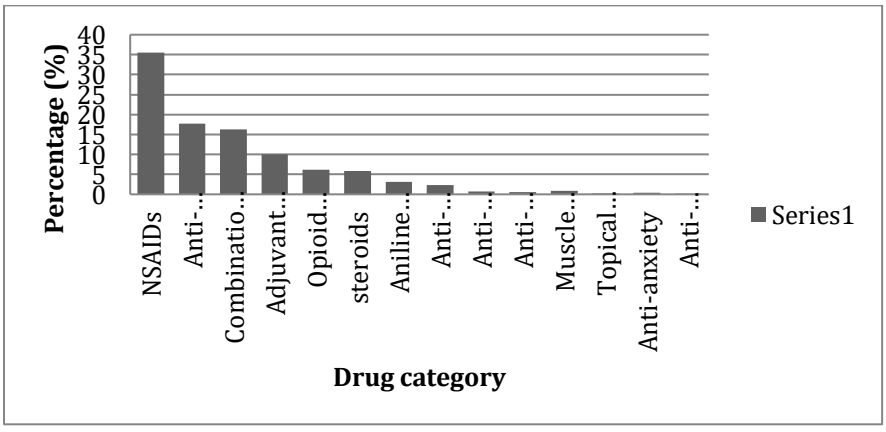

Figure 4: Category wise distribution of drugs in patients

Table 5: Gender distribution of Opioid prescriptions (N= 38)

S. No	Parameters	Number of patients (N=38)	Percentage (%)
1.	Male	19	50
2.	Female	19	50

The study results shows that 50% are males and 50% are females. It means equal proportion of opioids was prescribed in both genders.

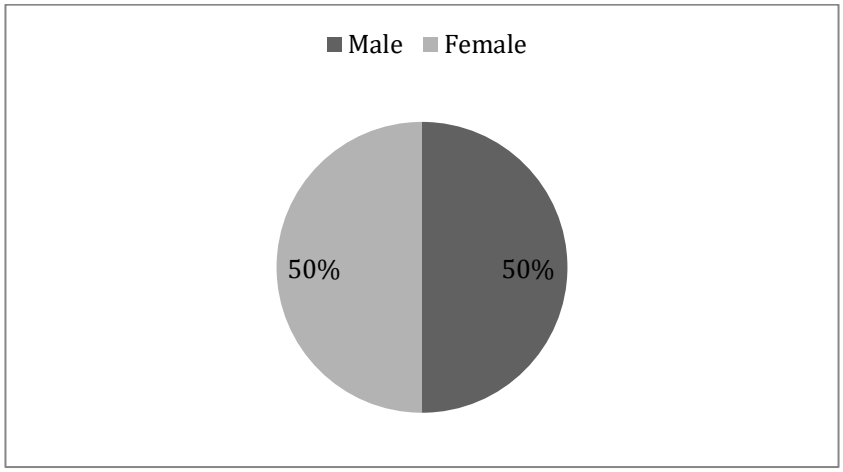

Figure 5: Gender wise distribution of Male and Female in Opioid prescriptions

Table 6: Gender distribution of Non-opioid prescriptions

S. No	Gender	No. of patients (N=989)	Percentage (%)
1	Male	469	47.42
2	Female	520	52.57

The study results shows that 47.42% are males and 52.57% are females. It means females are having high percentage when compared to males.

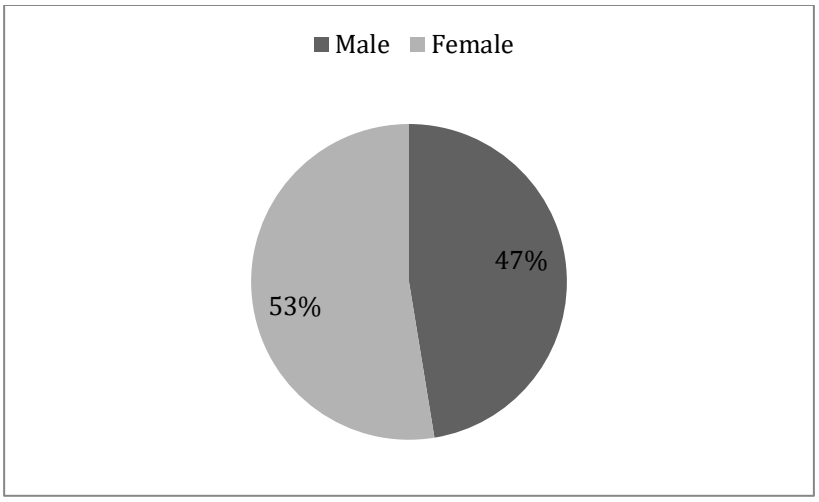

Figure 6: Gender wise distribution of Male and Female in Non-opioid prescriptions

Table 7: Gender distribution of combined prescriptions (opioid and non-opioid)

S. No	Gender	No. of patients (N=88)	Percentage (%)
1	Male	40	45.45
2	Female	48	54.54

The study results shows that 45.45% are males and 54.54% are females. It means females are having high percentage when compared to males

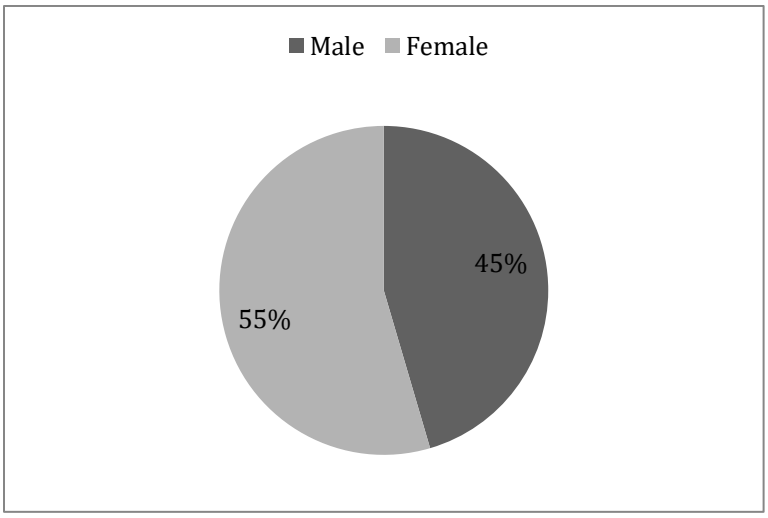

Figure 7: Gender wise distribution of Male and Female in Combined prescriptions

Table 8: Department wise distribution of patients

S. No	Department	Number of cases (N=1115)	Percentage (%)
1	Neurosurgery	661	59.28
2	General medicine	228	20.44
3	Orthopedic	164	14.70
4	Nephrology	58	5.20
5	Emergency and Trauma care	4	0.35

Department wise distribution of patients were analyzed and it was found that 59.28% are from Neurosurgery, 20.44% are from General medicine, 14.70% are from Orthopedic, 5.20% are from Nephrology and 0.35% are from Emergency and Trauma care.

More number of analgesics was found in the Neurosurgery department followed by General Medicine because more number of patients came with neurological disorders and general disease conditions. Less number of analgesics was found in the Nephrology & Emergency and Trauma Care because analgesics were less commonly prescribed in Nephrology since analgesics interfere with kidney functioning and less number of patients were found from the Emergency and trauma care department.

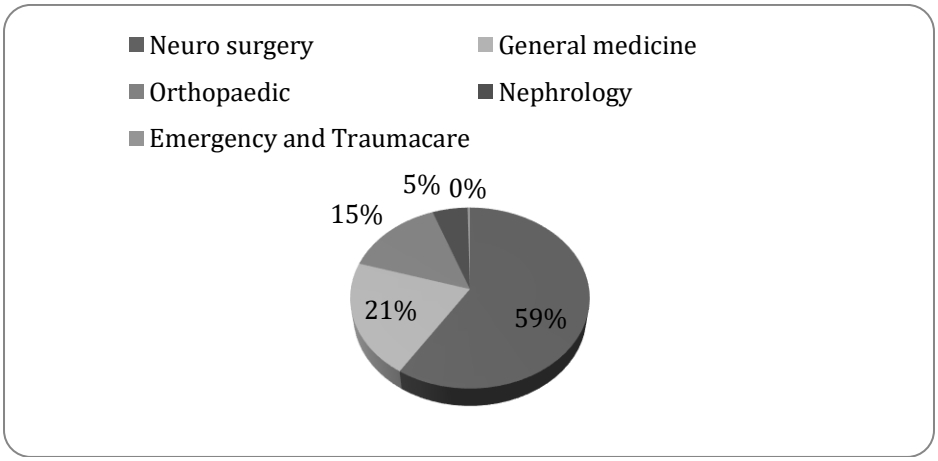

Figure 8: Department wise distribution patients

DISCUSSION:

Total number of 1115 patients was analyzed in the study period. Female prescriptions are more when compared to male prescriptions. The majority of analgesic prescriptions were found in the age group of 40-49. Among NSAIDs, Naproxen was found to be the most commonly prescribed drug as it is considered long-acting, and can be given twice daily. It has a slower onset of effect and is better suited for the treatment of chronic conditions. In combination analgesics, Flupirtine + paracetamol was found to be the most commonly prescribed combination analgesic as flupirtine works by blocking transmission of pain signals to the brain to lower pain perception and paracetamol works by blocking the release of certain chemical messengers that cause fever and pain [12]. Other combination analgesics used mostly are diclofenac + metaxalone and aceclofenac + paracetamol. More analgesic prescriptions were found from the department of Neurosurgery (59.28%) followed by General Medicine (20.44%). Category wise distribution of drugs was analyzed and it was found that NSAIDs (35.59%) are with the high percentage. Anti-depressant drug like paroxetine and anticonvulsant drug like gabapentin are commonly

prescribed for neuropathic pain mainly in the Neurosurgery department. According to Sandeep kaur Golar et.al., analgesics were used mainly for headache and migraine but in our study we found that analgesics are mainly used for headache and spondylolisthesis in outpatients [6]. According to Y. krupa Angel et.al., Tramadol was the most commonly prescribed opioid analgesics but in our study we found that Tapentadol is widely used in outpatients and tramadol was prescribed in combination with paracetamol [9]. Analgesics are less commonly prescribed in Nephrology department since analgesic drugs interfere with the kidney functioning.

CONCLUSION:

The percentages of analgesics prescribing from NLEM (National List of Essential Medicine) [13] and the use of analgesics by generic name were found satisfactory. Undertreated pain management observed in some of the studied patients was due to poor assessment of underlying pain. Drug utilization data can help us to follow appropriate clinical guidelines for drug use and regular educational interventions to improve prescribing practices among physicians at different levels may further promote rational prescribing. Patients should be educated well about the dose, duration and frequency of the drug by conducting counselling sessions. The support and involvement of medical staff is essential for the success of DUE program. Moreover, inclusion of pharmacist in healthcare team with proper designated authorities can also play a key role in overcoming the lacking of undertreated pain management.

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