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"A PROSPECTIVE EVALUATION OF DRUG USE PATTERN IN EMERGENCY CARE DEPARTMENT OF A TERTIARY CARE HOSPITAL"

Vicky Madhav Singh[1]*, Sachin B.[1], Uday Kumar R.[1] and Nagendra Gowda M.R.[2]

[1]Department of Pharmacy Practice, S.J.M College of Pharmacy, Chitradurga (Karnataka).

[2]Department of Community Medicine, B.M.C.H & RC, Chitradurga (Karnataka).

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***Corresponding Author'**
Dr. Vicky Madhav Singh
Department of Pharmacy Practice, S.J.M College of Pharmacy, Chitradurga (Karnataka).

ABSTRACT

Background: Emergency care department/ Intensive care unit (ICU) is a setting where large numbers of drugs are administered to patients and where the cost of hospitalization and drug treatment are high. ***Objective:*** The primary objective was to assess drug use pattern in Emergency care department of a tertiary care hospital. ***Material and method:*** The study was a prospective study for a period of six months. Prescription and patient records were reviewed and analyzed. SPSS version 19 was used to calculate the statistical parameters. ***Result:*** A total of 100 patients age more than 18 years were enrolled for the study among which 55 were females and 45 were males. Mean age of the patients was 53.27±17.17 years. Patients with respiratory, cardiovascular and infectious emergency were more. Cephalosporin 55.08% was most commonly prescribed Anti-Biotic. Insulin and metformin were commonly used Anti-Diabetics and ACE inhibitor, ARBs was common Antihypertensive. ***Conclucion:*** This study performed to bring awareness in the health care professionals for a successful treatment.

KEYWORDS: Drug use pattern, Emergency care department, Intensive care unit (ICU), Statistical package for Social science (SPSS).

INTRODUCTION

The World Health Organization (WHO) defines drug utilization (DU) research as "the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences". Thus, inherent in the definition,

such studies provide logical background for determining the rationality of drug use as well as providing evidence based guidance for making policy decisions at various levels of healthcare.[1]

The study of prescribing patterns is a part of the medical audit and seeks to monitor, evaluate, and if necessary, suggest modifications in prescribing practices to make medical care rational and cost-effective.[2] Information about drug use patterns is necessary for a constructive approach to problems that arise from the multiple antibiotics available.[3]

The study of prescribing practices as a part of drug utilization studies, has therefore been introduced as a tool to assess and evaluate rationality in therapeutic practices and to improve use of medications.[4]

The practice of emergency medicine has the primary mission of evaluating, managing and providing treatment to those patients with unexpected injury or illness.[6] Emergency medicine is the specialty that cares for the care seeker, at the most vulnerable moments of their life. According to the International Federation for Emergency Medicine is a field of practice based on the knowledge and skills required for the prevention, diagnosis and management of acute and urgent aspects of illness and injury affecting patients.[5]

Patients admitted to the Medical Intensive Care Unit (MICU) are seriously ill and are often suffering from different types of critical illnesses. These patients receive multiple medications from a variety of pharmacological classes due to various life threatening illnesses.[6]

Emergency department (ED) provide large platform for DU study where there is chances of irrational prescribing. Irrational prescribing of drugs may tend to produce an unproductive and a risky treatment to an individual; such a prescription may exacerbate or prolong the illness making higher the costs of treatment or both. Clinicians often face challenges in prescribing the right medication and initiating the right therapy, especially when it comes to emergency care department and that's where the chances of irrational prescriptions and errors usually happen.[7]

Hence the present study was designed to evaluate drug use pattern in emergency care unit of tertiary care hospital.

Objective of the study

To evaluate the drug utilization pattern in emergency care unit.

MATERIALS AND METHODS

Study site

This study was conducted at emergency care unit, Basaveshwara Medical College Hospital & Research center (BMCH & RC), Chitradurga.

Study design

Prospective Observational Study.

Study approval

The study was approved by the "Institutional Human Ethical Committee" of the S.J.M College of Pharmacy, Chitradurga. (SJMCP/IEC/543F/2014-2015 Date– 13/10/2014).

Study period

The study was conducted for a period of six months.

Study subjects

The study includes hospital in-patients admitted in emergency department. Patient who meets the following criteria was enrolled.

A. Inclusion Criteria

- Patient admitted as in-patient and those who stayed a minimum of 6 hrs at hospital.
- Patients of both genders.

B. Exclusion Criteria

- Outpatient.
- Death.
- Other department patient.

Sources of data

Patient's prescriptions, Medical records of In-patients, Interviews with patient and/or care givers.

Study procedure

Patients who satisfy above study criteria were included into the study. Study started with informed consent process. Patient's demographic details, medical history, social history, diagnosis information, prescribed drugs were documented in a suitably designed data collection form.

Statistical Analysis

The data was entered in Microsoft Excel-2013 version and were analyzed by using Statistical Package for Social Services (SPSS 19.0). All data were analyzed by descriptive statistics.

RESULTS

The data collected during the study period were analyzed for various parameters like age, genders distribution of patients, social history, pre-morbid condition, diagnosis and treatment given to the patients. A total of 100 patients were enrolled in the study.

In the study population 55% (55) were females and 45 %(45) were males. The results are shown in Table- 1.

The patients were categorized into 7 groups based on their ages. Mean age of the patients was 53.27±17.17 years. Out of 100 patients, 25 (25%) patients were in the age group of 41-50 yrs and further followed as represented in Table-2.

The past medical history of the patients is shown in Table-3. Out of 100 patients (n=100), 1% patients were with Anaemia, 5% had Bronchial Asthma, 30% were with HTN, 2% were with COPD, 29% were with Diabetes, 2% with IHD and 1% had TB. 1% patient was without Past History.

Table-4 shows the social history of patients. Out of 100 patients, (n=100), the social history was present in 40 patients. Among study subject 10% patient were alcoholic, 25% were Smoker and 5% had the hobbits of alcohol and smoking both.

The morbidity of the patients is illustrated in Table-5. Out of 100 study subject (n=100), 1 patient was diagnosed with Accelerated HTN, 7 patient were diagnosed with Acute exacerbation of COPD, 6 with Acute exacerbation of Bronchial Asthma. 6 patients were diagnosed with acute Gastroenteritis, 5 patients were with Anaemia. 2 patients were diagnosed with CCF. 15 patients were diagnosed with Coronary Artery Diseases and 1 with

cellulitis of the leg. 10 patients were diagnosed with Dengue Fever, 1 with Generalized Tonic Clonic Seizure. 4 patients admitted were diagnosed with HTN and Hypertensive encephalopathy. 3 patients were diagnosed with hypoglycaemia and 2 with LVF. The prevalence of LRTI was 4% and 1 patient was found to be of malarial fever. Prevalence of Pneumonia cases was 4%. Prevalence of type-1 Diabetes was 3% while 5 patients were diagnosed with Type-2 Diabetes Mellitus. The prevalence of Senile Bowel Disorder, Pleural Effusion, Septicaemic Shock and Temporal Cerebritis was found to be of 1%. 11 patients were diagnosed with viral fever. Among 100 patients 4 % patient were diagnosed with UTI.

Table-6 show drug utilization of different classes of antibiotics. Among 100 study population (n=100) cephalosporin antibiotic 65 (55.08%), was most frequently prescribed antibiotic followed by macrolide 17(14.40%), fluoroquinolones 10(8.47%), tetracycline 10 (8.47%), broad spectrum penicillin 10 (8.47%), beta-lacatmase antibiotic 4(3.38%). Amino glycosides was very least prescribed.

Table-7 shows utilization pattern of anti-gastric agents. Among 100 studies population in emergency ward patients receiving proton pump inhibitor (pantoprazole, rabeprazole and omeprazole) is 73.83%, followed by H2- receptor antagonist (ranitidine) is 9.35%.

Table-8 show the prescribing of Anti-malarial agents. The use of artisunate was found to be of 70.59%. The use of combination of lumefentrine+ artimether was found to be of 17.64%. The use of quinine was very least, i.e-11.76%.

Table-9 represent prescribing pattern of antidiabetic. Insulin 20 (42.55%) are the commonly prescribed class of drugs. In this class, Regular Human Insulin is the most preferable drug. After Insulin, Metformin 10(21.28%) are prescribed frequently followed by Glimepiride and Glipizide 17.02%, 10.64% respectively. Sitagliptine was least prescribed drugs i.e. 8.51%.

Table-10 shows use of NSAIDs in critical care unit. Paracetamol (85.13%) was more frequently prescribed agent from this class. Diclofenac sodium (14.86%) was less prescribed drug.

Table-11 shows the use of anti-hypertensives agent. In critical care unit more patients were receiving ACE inhibitor 15(15%) followed by ARBs 11 (11%) and CCB 7(7%). Beta blocker 1(1%) was less prescribed antihypertensive drug.

Table-12 represents the use of anti-asthametics. In 100 study subject (n=100) the combination of theophylline+ etiophylline 13 (13%) was more frequently prescribed. Utilization pattern of montelukast was just 1%. The utilization of ambroxol was 6%. The utilization pattern of Salbutamol was found to be of 8% followed by Ipratropium Bromide (4%).

Table -13 represent utilization pattern of anti-coagulants. Enoxaparin was highly prescribed (58.82%). Utilization of low. Mol. Weight heparin was 29.42%. Warfarin was least prescribed anticoagulant (11.76%).

Table-1: Distribution of patients according to Gender (n=100)

Gender	No. of Patients	% of patients
Male	45	45
Female	55	55

Table -2: Distribution of patients according to Age groups (n=100)

Age group (in years)	No. of patients	% of patients
Below 30 years	14	14
31 – 40 years	7	7
41 – 50 years	25	25
51 – 60 years	17	17
61 – 70 years	25	25
71 – 80 years	9	9
More than 80 years	3	3

Table-3: Distribution of patients based on their Medical History (n=100)

Medical history	No. of patients	% of patients
Anemia	1	1
Asthma	5	5
Hypertension	30	30
COPD	2	2
Diabetes	29	29
IHD	2	2
TB	1	1
Nothing significant	1	1

Table-4: Distribution of patients based on Social Habbits (n=100)

Social Habbits	No. of patients	% of patients
Alcohol	10	10
Smoking	25	25
Alcohol + Smoking	5	5

Table-5: Distribution of patients based on Diagnosis.

Diagnosis	No. of patients	% of patients
Accelerated hypertension	1	1
Acute exacerbation of COPD	7	7
Acute exacerbation of Asthma	6	6
Acute gastroenteritis	6	6
Anaemia	5	5
Congestive cardiac failure	2	2
Cellulitis of leg	1	1
Coronary Heart Disease	15	15
Dengue fever	10	10
Generalized Clonic and Tonic Seizure	1	1
Hypertension	3	3
Hypertensive encephalopathy	1	1
Hypoglycaemia	3	3
Left ventricular failure	2	2
LRTI	4	4
Malarial fever	1	1
Pneumonia	4	4
Pleural effusion	1	1
Senile bowel disorder	1	1
Septicemic shock	1	1
Temporal cerebritis	1	1
Type 1 Diabetes Mellitus	3	3
Type 2 Diabetes Mellitus	5	5
Urinary tract infection	4	4
Viral fever	11	11

Table-6: Drug utilization of Anti-biotics.

Antibiotics	Drugs	No of prescription	Percentage
Cephalosporin	Ceftriaxone	59	55..08%
	Cefpodoxime	2	
	Ceftazidime	1	
	Cefotaxime	1	
	Cefixime	2	
Tetracycline	Doxycycline	10	8.47%
Fluoroquinolones	Levofloxacin	5	8.47%
	Ofloxacin	5	
Macrolides	Azithromycin	17	14.40%
Aminoglycosides	Amikacin	2	1.69%
Beta lactamase antibiotics	Tazobactam	4	3.38%
	Salbactam	4	
Penicillin	Piperacillin	9	8.47
	Amoxicillin	1	

Table-7: Utilization of Anti-gastric drugs.

Drug	Frequency	Percentage
Proton Pump Inhibitor:	97	73.83%
H_2-receptor antagonist:	10	9.35%

Table-8: Utilization of Anti- Malarial Drugs

Drug	Frequency	Percentage
Artisunate	12	70.59%
Artimether + lumefentrine	3	17.64%
Quinine	2	11.76%

Table-9: Utilization pattern of Anti-diabetics.

DRUGS	Therapeutic class	Frequency	Percentage
Insulin	Insulin	20	42.55%
Metformin	Biguanides	10	21.28%
Glipizide	Sulfonyl urea	5	10.64%
Glimepiride	Sulfonyl ureas	8	17.02%
Sitagliptin	Sulfonyl ureas	4	8.51%

Table-10: Utilization Pattern of NSAIDs

NSAIDs	Frequency	Percentage
Paracetamol	63	85.13%
Diclofenac	11	14.86%

Table-11: Antihypertensive utilization pattern

Anti-Hypertensive	Frequency	Percent
ACE inhibitors	15	15
Angiotensin receptor blockers	11	11
Beta blockers	1	1
Calcium channel blockers	7	7
No Antihypertensive	66	66

Table-12: Anti-asthmatics Utilization pattern.

Anti-Asthmatics	Frequency	Percent
Ambroxol	6	6
Monteleukast	1	1
Salbutamol	8	8
Ipratropium bromide	4	4
Throphylline and Etiophylline	13	13

Table-13: Utilization pattern of Anticoagulants

Anti-coagulants	Frequency	Percent
Enoxaparin	10	52.82
Low Mol. Weight heparin	5	29.42
Warfarin	2	11.76

DISCUSSION

This was a prospective observational study conducted at emergency department of Basaveswara medical college hospital Chitradurgas. The emergency department of a tertiary care unit of a developing country is faced with the problem of heavy patient load. our hospital is a premier tertiary care hospital which caters to a large population pool of the south Indian region.[1] Emergency department (ED) presents with a major patient safety challenges and requires fast-paced, complex and urgent high-risk decision-making, by physicians and clinical pharmacist with varying levels of Emergency care training.[2] In our study population 55% (55) were females and 45%(45) were males. Vandana A.B, Sanjaykumar B. N conducted a similar study which shows that out of 480 patients 57.29% were male and 42.7% were females.[3] in the present study patients were categorized into 7 groups based on their ages. Out of 100 patients Among 100 patients 25 (25%) patients in the age group of 41-50 yrs. Preksha A et al., conducted a study which reveals, Majority 37 (23.71%) of patients presenting to emergency medicine department were 61-70 years of age followed by 30 (19.23%) patients with 51-60 years of age group.[5] The present study reveals that cardiovascular emergency were more. A study conducted by Vandana A.B, Sanjaykumar B. N suggest that the cardiovascular emergency were more.[3] cephalosporin antibiotic 65 (55.08%), was most frequently prescribed antibiotic followed by macrolide 17(14.40%), fluoroquinolones 10(8.47%), tetracycline 10 (8.47%), broad spectrum penicillin 10 (8.47%), beta-lacatmase antibiotic 4(3.38%). Preksha A et al., conducted a similar study that state third generation cephalosporin, ceftriaxone was the most commonly prescribed drug in 51 (32.69%) patients.[5] our study show that, in emergency ward proton pump inhibitors are more frequently prescribed anti-gastric agent. Paracetamol was the choice of NSAIDs drug. In our study we have analyzed the prescriptions of 100 sujects among which combination of theophylline+ etiophylline 13 (13%) was more frequently prescribed anti-asthametic drugs. Kamnath L et al., carried a study drug treatment in patients with exacerbations of bronchial asthma in an emergency ward, result show that *I.V.* theophylline was choice of agent. Insulin 20 (42.55%) are the commonly prescribed hypoglycaemic agent followed by Metformin 10(21.28%). Shruti V.B et al., conducted a study that represent insulin was the choice of agent in diabetics admitted to critical care centre.[10] According to the present study in critical care unit more patients were receiving ACE inhibitor 15(15%) followed by ARBs 11 (11%) and CCB 7(7%). A study done Elhami E et al., show, the most common drug prescribed was ACE follow by diuretics drugs.[11] In our study we have observed that Enoxaparin was highly

prescribed (58.82%). Vijay S et al., carried a similar study that represent Enoxaparin and acenocoumarol were other commonly used drugs.[12]

CONCLUSION

This prospective observational study includes 100 subjects admitted to critical care unit. Our study revealed antibiotics, anti-asthmatics, anti-coagulants, NSAIDs, Anti-diabetcs were mainly prescribed drug in Emergency care department. This study highlights the need for rationalising drug therapy in the emergency unit. There is need to prevent inappropriate and over use of antibiotics.

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