

DRUG UTILIZATION PATTERN IN EMERGENCY DEPARTMENT AT A TERTIARY CARE HOSPITAL

Badikela Rama krishna¹, Shaik Harun Rasheed²

¹Department of Pharmaceutical analysis and Quality assurance, at Guru Nanak Institutions Technical Campus-School of Pharmacy, Ibrahimpatnam, Ranga Reddy - 501506, Telangana, India.

²Department of Pharmaceutics, Guru Nanak Institutions Technical Campus-School of Pharmacy, Ibrahimpatnam, Ranga Reddy - 501506, Telangana, India.

Correspondence to Author:

Badikela.Rama Krishna,*

Department of Pharmaceutical analysis and Quality assurance, at Guru Nanak Institutions Technical Campus-School of Pharmacy (Autonomous), Ibrahimpatnam, Ranga Reddy - 501506, Telangana, India.

ABSTRACT:

Drug utilization studies ensure patient safety by assessing the safe and effective use of drugs, optimize treatment strategies for better outcomes and contribute to overall quality improvement in emergency care. This study was conducted in Emergency In-Patient department after the approval of the Ethical Committee. Patients was selected based on inclusion and exclusion criteria. The patient's data was collected and distributed on the basis of age, gender, comorbidities, disease and drug class. In which the patients were observed for 6 month and the conclusion was obtained with the sample size of 100 patients. Where the result was obtained according to the gender in which Male (64%) were more prone to disease then Female (36%). Then according to the age group (51-60) years were more prone for disease i.e. 28% then (61-70) years patients were 24% and the least age group who visited Emergency department are (91-100) years i.e. 3%. The most common comorbidities which were observed during the study were Hypertension i.e. (56 Patients), Diabetes Mellites i.e. (45 Patients), Hypothyroidism i.e. (10 Patients), Coronary artery disease i.e. (15 Patients), and many more but the least one comorbidities by which patients are affected are Acs TVD, Schizophrenia, DM1, Hypertriglyceridemia, vertigo, old Kochs disorder Type 2 respiratory failure, Hypoglycaemia. 10 patients were also their who was having no comorbidities. We also distributed patients

according to their disease and disease class, the commonly disease which was observed in ER were 14 with Acute ischemic stroke, 14 with Traumatic brain injury, 11 with encephalopathy, 10 with CKD, 9 with ADHF, 8 with Parkinson's, 8 with Pneumonia bronchitis, 8 with CVA and the least by which patients were affected are septic shock, COPD, neurogenic shock, electric burn, asthma, hypoglycaemia, old SAH with IVH and IC bleed and many more. And the class of drug which were popularly used were 90 patients with proton pump inhibitor, 47 with multivitamins, 46 with antiemetic, 29 with antibiotics, 28 with analgesics, 16 anticonvulsants, 15 antiplatelet and the least class of drug is being prescribed are antiarrhythmic agent, psychedelics agents, factor X-A inhibitor, thyroid drugs, immune booster etc. The most common drug was being used in ER are Pantoprazole, Ondansetron, Optineuron and Acetaminophen and the least drug which was being used in ER were Doxycycline, Metoprolol, Clonazepam, Alteplase, Nitro-glycerine, Telmisartan, Ipratropium bromide etc. In this the findings highlight the need for promoting rational drug therapy by encouraging the prescription of essential drugs using their generic names to improve health care outcomes and also in optimizing drug therapy in Emergency department.

INTRODUCTION:

Drug utilization review is an authorized, systematic, continuous assessment of the prescription, dispensing, and use of medication. DUR includes a review of drugs based on pre-established criteria, and if these are not satisfied, modifications to medication therapy are implemented. In order to guarantee effective pharmaceutical decision-making and favourable patient outcomes, it entails a thorough evaluation of patient's prescriptions and drug data before, during, and after distribution. DUR programs include corrective action, prescriber feedback, and additional evaluations as a quality assurance measure.[1]

Importance of DUR:

The prescription, administration, and the use of pharmaceuticals can be better understood, interpreted, evaluated, and improved with the use of DUR programs, which are essential to manage health care systems.. Because of their knowledge in the field of pharmaceutical therapy management, chemists are essential to this procedure. The managed care pharmacist can use DUR to find patterns in patient prescribing, whether it is based on drug-specific criteria or disease-state criteria like high blood pressure, diabetes, or asthma. Subsequently, chemists could work with prescribers and other members of the healthcare team to improve drug therapy.[2]

It gives the doctors insightful input regarding the prescription rationality by analyzing the results of various intervention type offered to enhance rationality in drugs use. It also evaluates the intervention influences drug use in the population. Drugs use research can be conducted using a variety of technique that are qualitative or quantitative. The comprehension of numerous facets, diverse design and who criteria for carrying out drug uses research is highlighted in this study.[3]

Steps involve in conducting Drug Evaluation-

- Identify/determine optimal use
- Measure actual use
- Evaluate
- Intervene
- Evaluate the DUR program
- Report the DUR found

Problems related to drug prescriptions are common worldwide, with medication errors and adverse drug events being the primary causes. In Emergency department patients are admitted without any prior appointment by their own/with ambulance for the examination of urgent or emergent conditions requiring after-hours medical attention. Doctors in the ED deal with serious, urgent cases that require prompt, effective care. This makes it difficult for doctors to start and choose the right medications for their patients. Because of that patient suffering from a wide range of disease in a variety of acute or high drug use, ED are an important place for conducting drug utilization studies.[4] It assesses the initial stages of the disease, and diagnose it. These mostly consist of Adverse drug events and medication blunders. Medication errors accounted for 5.7% of all drug administration episodes, according to a meta-analysis of 35 studies published between 1990 and 2005, whereas adverse drug events impacted 6.1 patients out of every 100 hospitalised patients.[5-8] Prescription errors are influenced by many factors, including polypharmacy, lack of adequate pharmacological knowledge, errors in patient records or nursing documentation, inadequate pharmacy staffing, female gender, age > 65 years, renal excretion of drugs, drugs with narrow therapeutic index, and usage of Anticoagulants and diuretics.[9] Moreover, adverse medication events ranging from 3% to 12% have been routinely recorded in a number of US research.[10] Based on these research, the emergency department (ED) sees 1.5–3% of all adverse medication occurrences. On the other hand, the EDs had the greatest percentage of avoidable error prevalence (70–82%).

TRIAGE PROCESS:

Triage is a Prioritizing of patient treatment (or catastrophe victims) according to illness/injury, severity, prognosis, and resource availability is known as triage. Identifying patients in need of emergency resuscitation, placing them in a designated patient care area to priorities their care, and starting diagnostic or therapeutic procedures as necessary are the goals of triage.[11]

The process of triage which typically involves taking vital signs and assigning a "chief complaint" (e.g., chest pain, abdominal pain, difficulty breathing, etc.), is the first step a patient goes through. The majority of emergency rooms have a specific space set aside for this procedure, and they may employ personal whose sole responsibility is triaging patients. Most departments assign a triage nurse to this position, although other medical personnel, including as paramedics and physicians, may also be tasked with triage sorting, depending on training standards in the nation and region.[12]

RED – EMERGENCY

A life-threatening medical condition. Expect to receive Immediate attention.

ORANGE - VERY URGENT

A serious medical condition. Expect attention after red patients have been stabilised

YELLOW - URGENT

Expect attention after red and orange patients have been stabilised.

GREEN – ROUTINE

You can function without immediate care and will be attended to as soon as Possible.

METERIALS AND METHODS:**Participants**

A Minimum of 100 patients was included in this study.

1. Inclusion criteria:

- All patients irrespective of diagnosis admitted to emergency department.
- Patients above 18 years.
- Patients irrespective of Gender.

2. Exclusion criteria:

- Incomplete and illegible data were excluded.
- The patient who are from non-emergency department.
- The drug that where already being taken by the patient due to their concomitant
- illness were excluded.

- Pregnant/lactating females and age less than 18 years.
- Patient who refuses to give consent.

STUDY TYPE:

A Prospective Observational study.

STUDY DURATION:

6months.

STUDY PROCEDURE:

- Identifying the need of the study.
- Designing of the study proforma.
- After receiving approval from the Institutional ethical committee. The study was conducted in Emergency department.
- This study was an observational and prospective study on Emergency Department.
- All case sheet were reviewed and the cases which meet inclusion and exclusion criteria were selected.
- A proforma were designed in which the demographic details like age, gender, past medical history, present history, final diagnosis, and medication chart is included. In which Patient data will be collected during the study period.
- After collecting the data in proforma patient treatment chart will be studied.
- Then will observe the commonly reported cases and drugs being prescribed for the perticular disease in ER.
- All the prescribed drugs will be noted along with all the data being given in proforma.

STATISTICAL ANALYSIS: Data was entered in Microsoft Excel 2016 and also data was presented by using descriptive statistics i.e. Count and percentage. Data was visually represented by the pie diagram and bar graph. Data analysis was carried out by SPSS software version 22.

RESULTS:

It was a prospective observational study. This study includes 100 patients.

Table 1: Distribution of the Patients according to Gender (N=100)

Gender	No. of Patients	Percentage
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MALE	64	64%
FEMALE	36	36%

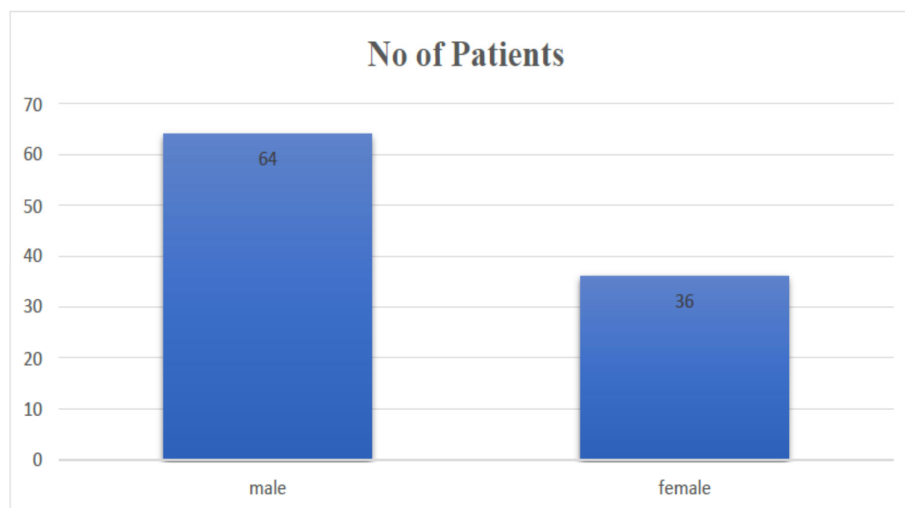


Fig. 1: Distribution Of Patients According to Gender.

ILLUSTRATION: Among the 100 patients 64% are male and 36% are female. It was observed that the male population are more compared to females in emergency department.

Table 2: Distribution of Patients according to age:

Age	No. of Patients	Percentage
20-30	5	5%
31-40	4	4%
41-50	8	8%
51-60	28	28%
61-70	24	24%
71-80	15	15%
81-90	13	13%
91-100	3	3%

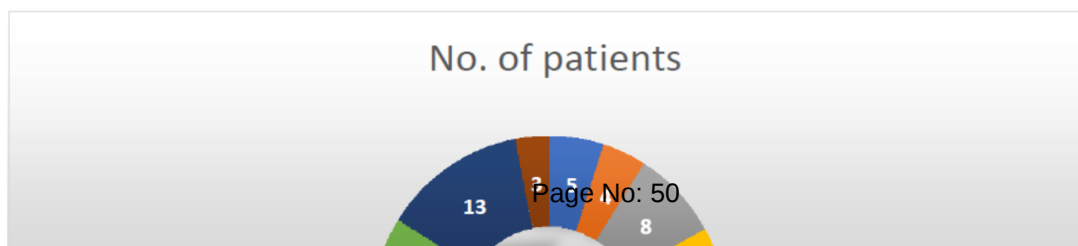


Fig. 2: Distribution of Patients According to Age

ILLUSTRATION: Figure indicates that in 100 patients 05 patients are under 20-30 age group, 04 patients are under 31-40 age group, 08 patients are under 41-50 age group, 28 patients are under 51-60 age group, 24 patients are under 61-70 age group, 15 patients are under 71-80 age group, 13 patients are under 81-90 age group, 03 patients are under 91-100 age group. In our present study it was found that patients above 50 years and below 90 years are more reported to ER.

Table 3: Distribution according to Comorbidities:

Comorbidities	No of Patients
HTN	56
DM1	1
DM-2	45
LA cervix stage 4 Hemorrhagic	1
Hypothyroidism	10
CAD	15
Seizures	2
Post stroke epilepsy	4

ADHF	7
Pyelonephritis	1
Asthma	4
CVA	10
Cardio embolic stroke	1
Psychiatric disorder	2
Epilepsy	3
Parkinsonism	7
Schizophrenia	1
Aspiration pneumonia	1
Type 2 respiratory failure	1
hypoglycemia	1
Bradycardia	2
Ischemic stroke	4
Old Kochs disorder	1
Cirrhosis of liver	1
Tuberculosis	1
Vertigo	1
CKD	7
Splenectomy	1
Pancreatitis	2
Hepatic jejunum	1
PAD	1
Tibial occlusion	1
Thrombolysis	1
Ileostomy	1
Ppb	1
Acute Myocarditis	1

SNHL	1
PTCA with stunt	3
Anemia	1
Acs NSTEMI	3
Psoriasis	1
MCTD	1
ICD	1
PCOD	1
Hyperthyroidism	2
Hyponatremia	1
Old PTB	1
Circulation Stroke	1
Tracheostomy	1
Hemiparesis	3
DVT	2
Acute Cardiogenic Pulmonary Edema	2
Moderate ARDS	2
Moderate LV Dysfunction	2
Acs TVD	1
Dry Gangrene	1
Grade 2 Prostomegaly	1
CNS lymphoma	1
Hypertriglyceridemia	1
Dementia	2
UTI	1
Portal HTN	1
Intracranial SDL	1
Ild	2
Nil	10

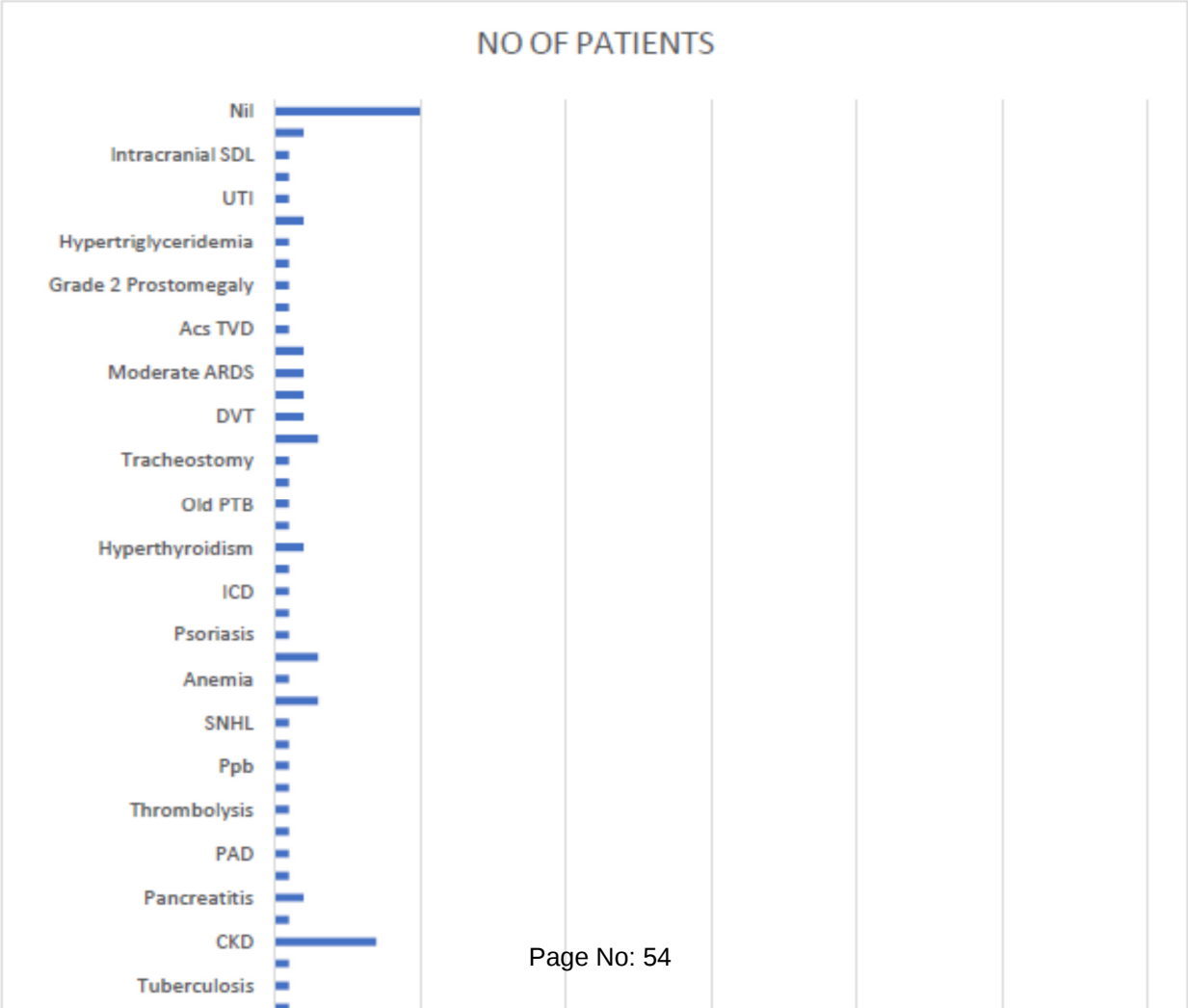


Fig. 3: Distribution of Patients According to comorbidities**ILLUSTRATION-**

Figure indicates that out of 100 patients 56 patients consisted Hypertension, 45 consisted diabetes mellitus, 10 Hypothyroidism, 15 CAD, 7 ADHF, 10 CVA, 7 Parkinson, 7CKD, 4 Post stroke epilepsy, 4 Asthma, 4 Ischemic stroke, 3 Epilepsy, 3 PTC and STUNT ,3 asc NSTEMI, 3 Hemiparesis, 2 Acute Cardiogenic Pulmonary Edema, 2 Moderate ARDS, 2 Moderate LV Dysfunction, 2 Dementia, 2 Ild, 2 Seizure, 2 Psychiatric disorder, 2 Bradycardia, 2 Pancreatitis, 2 Hyperthyroidism, 2 DVT,2 Acute cardiogenic and others like Acs TVD, Schizophrenia, DM1, Hypertriglyceridemia, vertigo, old Kochs disorder Type 2 respiratory failure, Hypoglycemia etc. and also there are 10 patient who is not having any past medical history.

TABLE 4: DISTRIBUTION OF PATIENTS ACCORDING TO DISEASE:

DISEASES	NO OF PATIENTS
Pneumonia bronchitis	8
Acute ischemic stroke	14
Hemorrhagic stroke	4
Traumatic brain injury	2
Seizures	14
CVA	8

Encephalopathy	11
LRTI, Type III	6
Septic shock	2
COPD	1
CAD	7
CKD	10
AKI	6
Hemiparalysis	2
Acute gastric shock	1
DKA	2
Fractures	4
Neurogenic shock	1
Febrile illness	4
Cholelithiasis	1
Parkinsonism	8
Vertigoz	1
ADHF	9
Gall stones in bladder	1
Altered mental state	1
UTI	4
Asthma	1
Electric burns	1
Hernia	1
Anaemia	3
AWMI	1
Myasthenia gravis	2
Arnold chiarinflammation	1
Hypoglycaemia	1
Hyponatremia	1
Cirrhosis	1
Cerebral edema	1
Old SAH with IVH	1
IC bleed	2

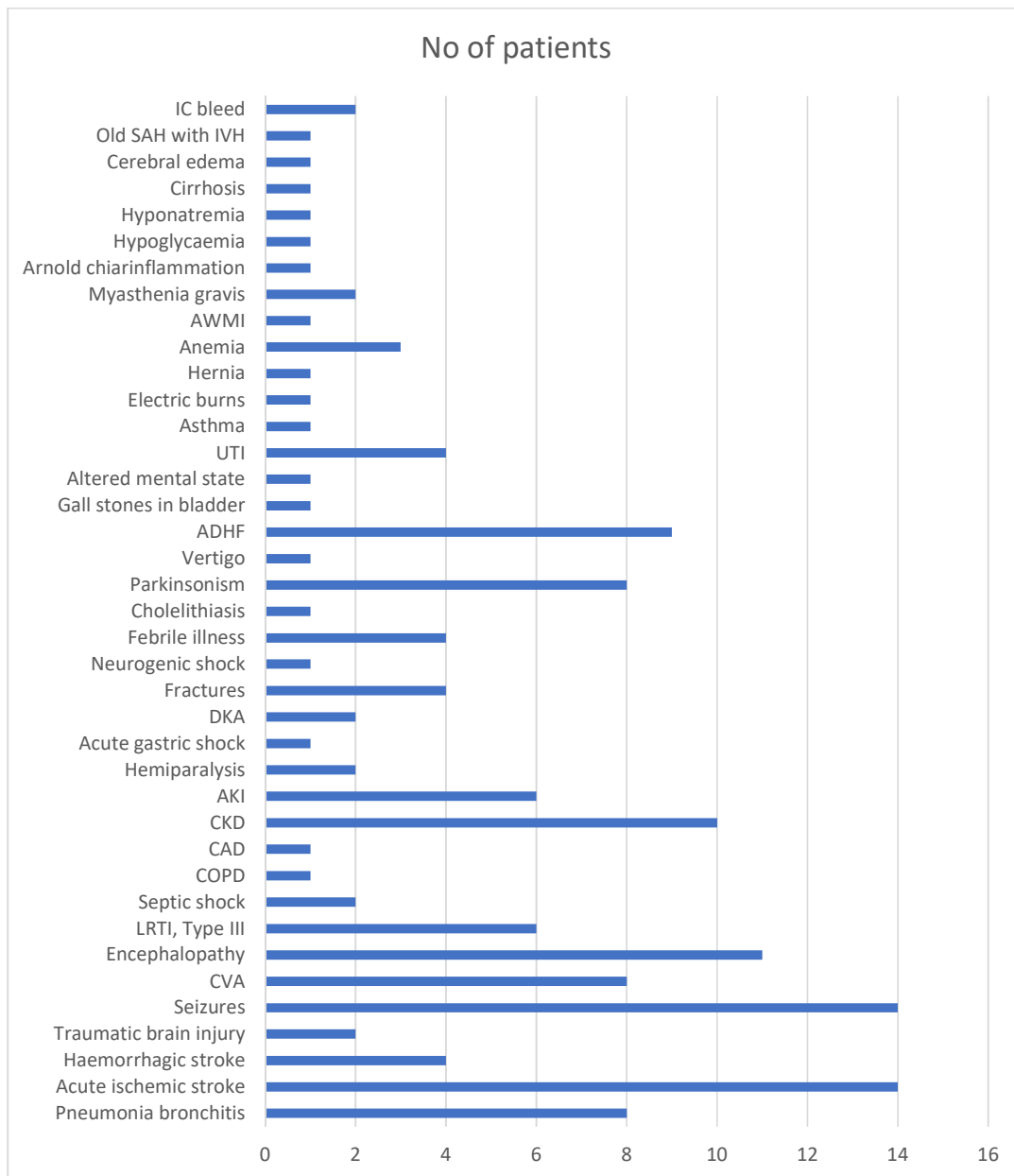


Fig. 4: Distribution of Patients According to Disease

ILLUSTRATION-

From the above figure we conclude that out of 100 patient 14 were affected with Acute ischemic stroke, 14 Traumatic brain injury, 11 encephalopathy, 10 CKD, 9 ADHF ,8 Parkinson's, 8 Pneumonia bronchitis, 8 CVA, 6 LRTI type-3, 6 AKI, 4 hemorrhagic strokes, 4 fracture, 4 febrile illness, 4 UTI, 3 Anemia and other diseases like septic shock, COPD, neurogenic shock, electric burn, asthma, hypoglycemia, hernia, altered mental state, hyponatremia, cirrhosis, cerebral edema, old SAH with IVH and IC bleed.

TABLE 5: DISTRIBUTION ACCORDING TO DRUG:

DRUGS	NO OF PATIENTS
Sodium Chloride	13
Furosemide	10
Pantoprazole	90
Ondansetron	46
Mannitol	4
Dexamethasone	1
Optineuron	45
Clopidogrel	5
Aspirin	10
Acetaminophen	28
Duolin	7
Budesonide	12
Calcium gluconate	11
Dextrose	4
Etomidate	2
Phytonadione	7
Tetanus toxoid	2
Cefuroxime	1
Levetiracetam	16
Levothyroxine	2
Magnesium sulphate	4
Hydrocortisone	9
Salbutamol	11
Ceftriaxone	2
Ursodeoxycholic Acid	1
Heptagon	1
Nor adrenaline	5
Syndopa	2
Vasopressin	1
Insulin	3
Metoprolol Succinate	1
Nico Malone	1
Torsemide	1
Tramadol	5
Nicorandil	2
Telmisartan	1
Ranolazine	1
Nitro-glycerin	1
Carvedilol	1

Lactulose	1
Magnex forte	10
Sodium bicarbonate	1
Dobutamine	1
Enoxaparin	3
Meropenem	4
Silver sulfadiazine	1
piperacillin	4
Atorvastatin	7
Alteplase	1
Ipratropium bromide	1
Escitalopram	1
Clonazepam	1
Clindamycin	7
Apixaban	1
Neurobionforte	1
Metoprolol	1
kcl+mgso4	1
Hyoscine butyl bromide	1
Fenofibrate	1
Doxycycline	1
Erythropoietin.	1
Atrovent	1
Tranexamic Acid	1
Rosuvastatin	1
Tenecteplase	1
Amiodaron	1
Lysergic acid Diethylamide	1
levocarnitine	1

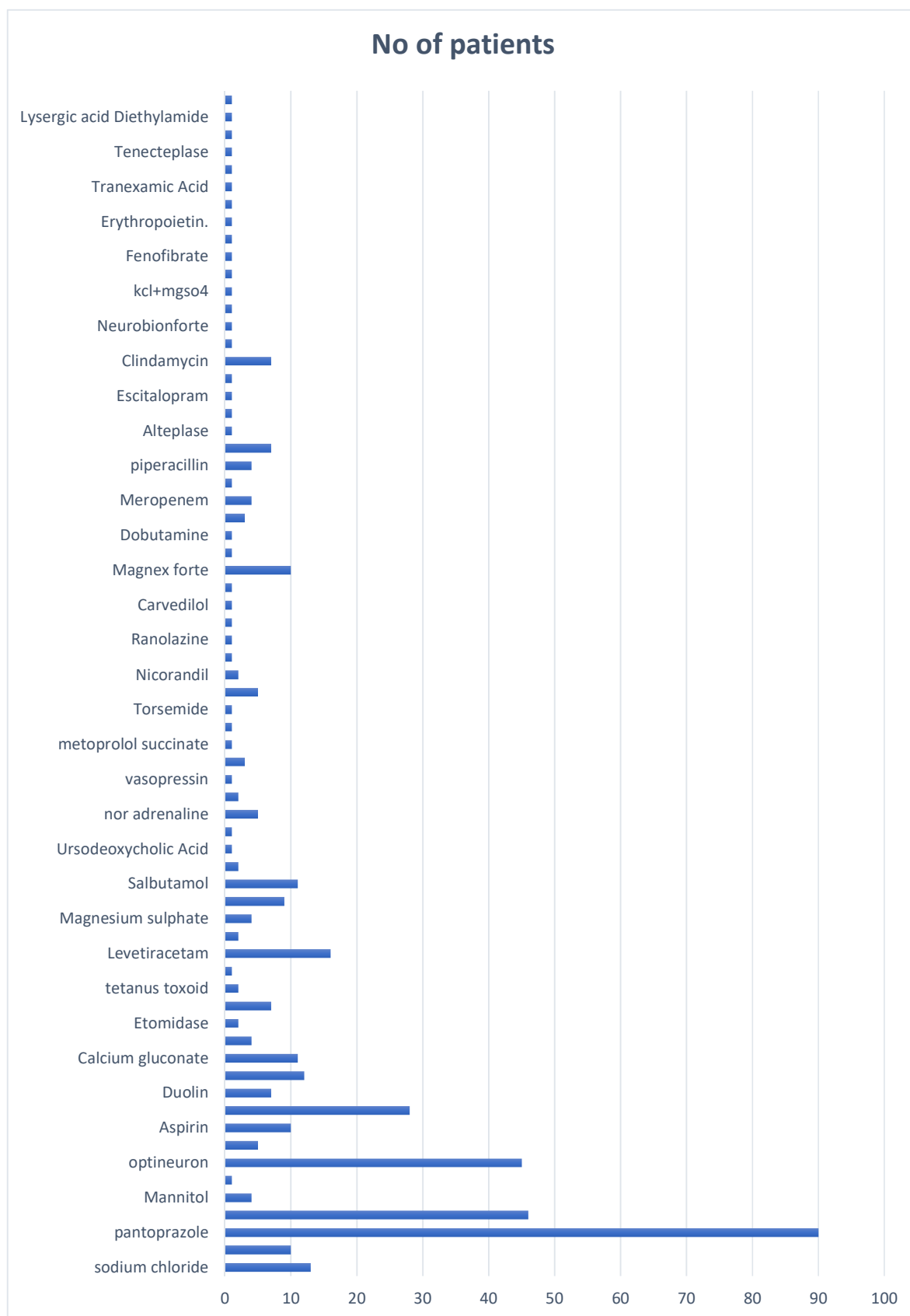


Fig. 5: Distribution of Patients According to Drug

ILLUSTRATION-

Out of 100 patients we observed that 90 patients were given with Pantoprazole, 46 with Ondansetron, 45 with Optineuron, 28 with Acetaminophen, 16 with Levetiracetam, 13 with Sodium Chloride, 12 with Budesonide, 11 Calcium gluconates, 11 with Salbutamol, 10 with Aspirin, 10 with Magnex forte, 10 with Furosemide, 9 with Hydrocortisone, 7 with Phytonadone, 7 with Atorvastatin, 7 with Clindamycin, 7 with Duolin, 5 with Tramadol, 5 with Noradrenaline, 5 with Clopidogrel, 4 with mannitol, 4 with Dextrose, 4 with Magnesium sulphate, 4 with Meropenem, 4 with Piperacillin, 3 with Insulin, 3 with Enoxaparin and others like Dexamethasone, Tetanus toxoid, Cefuroxime, Levothyroxine, Ceftriaxone, levocarnitine, Rosuvastatin, Doxycycline, Metoprolol, Clonazepam, Alteplase, Nitro-glycerine, Telmisartan, Ipratropium bromide etc.

TABLE 6: DISTRIBUTION OF DRUG ACCORDING TO CLASS:

DRUGS CLASS	NO OF PATIENTS
Anticonvulsant	16
Corticosteroid	12
Bronchodilator	11
Hepato Protective Agent	1
Nutritional Supplement	1
Adrenoceptor Agonists	5
Dopamine Agonist	2
Anti Diuretic	11
Anti Diabetic	3
Beta Blocker	3
Anticoagulant	3
Loop Diuretic	2
Opioid Analgesic	5
Potassium Channal Activator	2
Arbs	1
Metabolic Modulator	1
Vasodilator	1
Antilipemic	1
Laxative Agent	1
Tetracyclines	1
Antibiotics	29

Anticholinergic Agents	2
Erythropoiesis Stimulating Agents	1
Antifibrinolytics	2
Hmgco-A REDUCTASE INHIBITORS	8
Antiarrhythmic Agents	1
Psychedelics	1
Electrolytes	13
Anta Acids	90
Antiemetics	46
Diuretics	4
Multivitamins	47
Antiplatelet	15
NSAIDS	10
Analgesics	28
Calcium Supplements	11
Glucose Elevating Agent	4
Anaesthetic Agent	2
Immune Booster	1
Antithyroid Drugs	1
Alkalizing Agent	1
Sulphonyl Ureas	1
Thrombolytics	2
SSRIS	1
Factor-Xa Inhibitors	1
Cns Depressants	2
Tissue Plasminogen Activator	1
Ltras	1
Vitamine Supplements	7

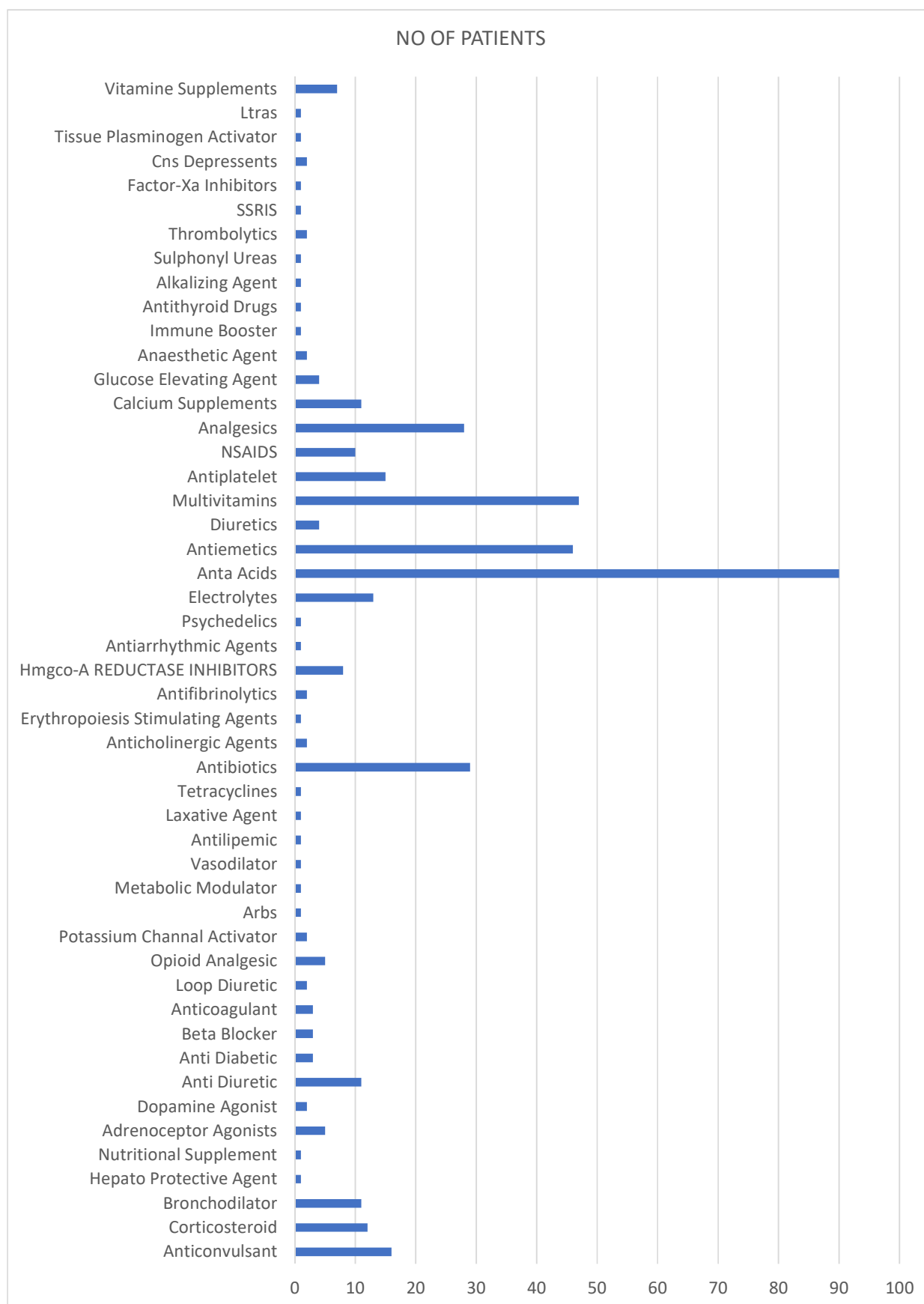


Fig. 6: Distribution of Drug According to Class

ILLUSTRATION-

From the above figure we conclude that out of 100 patients 90 patients were using the class of proton pump inhibitor, 47 multivitamins, 46 antiemetic, 29 antibiotics, 28 analgesics, 16 anticonvulsants, 15 antiplatelet, 13 electrolytes, 12 corticosteroids, 11 bronchodilator, 11 antidiuretics, 11 calcium supplements, 10 NSAIDs, 8 HMG CO-A reductase inhibitor, 7 vitamin supplements, 6 diuretics, 5 Adreno-receptor agonists, 5 opioid analgesic, 4 glucose elevating agent, 3 antidiuretics, 3 antidiabetic, 3 beta blockers, 3 anticoagulant, 2 anesthetic, 2 thrombolytic, 2 CNS depressants, 2 dopamine agonist, 2 potassium channel activator, 2 anticholinergic agents, 2 antifibrinolytics and other classes like hepatoprotective agents, nutritional supplement arbs, vasodilator, antilipemic, laxative agent, metabolic modulator, erythropoiesis stimulating agent, antiarrhythmic agent, psychedelics agents, factor X-A inhibitor, thyroid drugs, immune booster and etc.

DISCUSSION:

Analysing the drug utilization pattern in a care hospital was involved by a thorough examination of prescribing practices, therapeutic classes, and adherence to formulary guidelines. By assessing factors such as generic versus brand usage, and the duration of therapy, healthcare professionals can gain insights into the appropriateness and efficiency of medication regimens.

Our study is a prospective observational study in which 100 patients were examined for around 6month. Throughout the study period, 100 medication charts in total were examined and the patient's chief complains regarding the symptoms were observed and a proper stabilizing treatment were provided in ER according to a particular diagnosis. In which we have observed that-

- The male population are more recruited for this study as compare to female in emergency department. About 64% were male and 36% were female.
- Also, as per the data patients under 51-90 are more prone to disease, approximately 80% of the patients are under this age group.
- The most common disease which were observed in ER are-Acute ischemic stroke, Seizures, Encephalopathy, CAD, CKD, ADHF, Parkinsonism, UTI, Hypoglycemic and Anemia.
- As per our study we also analyzed some common comorbidities associated with the diagnosis are- HTN, DM 2, Hypothyroidism, CAD, ADHF, CVA, Parkinsonism, CKD, Post stroke epilepsy, Asthma, Ischemic stroke, Epilepsy, PTC and STUNT, asc NSTEMI, Hemiparesis.

- Also, we observed the common class of drugs which were commonly used in ER to stabilize the patients were proton pump inhibitor, multivitamins, antiemetic, antibiotics, analgesics, anticonvulsants, antiplatelet, electrolytes, corticosteroids, bronchodilator, antidiuretics, calcium supplements, NSAIDs, HMG CO-A reductase inhibitor, diuretics etc.

CONCLUSION:

Antibiotics, Antacid (proton pump inhibitor), analgesic, antiplatelet, NSAIDS and multivitamins were the most frequent class of drugs administered to patients. As per our study highest number of drugs was prescribed for the diseases like Seizures, Acute ischemic stroke, Encephalopathy, CAD, ADHF, Pneumonia bronchitis and followed by Parkinsonism and CKD diseases.

There is need for promotion of rationalized therapy in terms of increasing prescription of drugs from essential drug list by generic name.

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