



AMERICAN JOURNAL OF PHARMTECH RESEARCH

Journal home page: <http://www.ajptr.com/>

Drug Utilization Evaluation of Anti Cancer Drugs

Ayesha Siddiqua^{1*}, Hiba jafar¹, Nikhat tabassum¹, Sunaina firdous¹, Khaleequa tabassum¹.

1. Department of pharmacy practice, Yashoda Cancer Institute, Somajiguda, Hyderabad, Andhra Pradesh.

ABSTRACT

Drug utilization review can be defined as review of drugs used in a population to determine effectiveness, potential dangers faced by the patients, problems arising due to drug interaction and also promotes rational use of drugs. Rational use of drugs minimizes polypharmacy, drug interactions minimizing the hospital stay. Our objective was to understand the pattern of occurrence of various cancerous disorders and promote rational use of drugs. It was a prospective observational study which was undertaken in Yashoda Cancer Institute, Hyderabad under the guidance of Dr. N. Bethune for a period of 6 months. A total of 100 prescriptions were included in the study. The study criterion were the inpatients up to 90 yrs of age of either gender. Patient data relevant to the study was obtained from patient case records. According to the data collected we found that males (54%) predominated females (46%) and patients were more prominent in 41-60 age group. The use of anti cancer drugs in this hospital was found to be rational and more than 50% of the drugs prescribed are from National list of essential drugs. In conclusion, the use of anti cancer drugs was found to be rational. Pharmacist is the key person for better management of therapy based on stage and condition of patient and also manage the increased cost of therapy and increased risk of unwanted reactions. It has been our sincere effort to minimize the anticipated untoward events (at least to some extent) by our dissertation.

Keywords: Drug utilization review, effectiveness, drug interaction

*Corresponding Author Email: aishaa2804@gmail.com

Received 12 May 2014, Accepted 21 May 2014

Please cite this article in press as: Siddiqua A *et al* Drug Utilization Evaluation of Anti Cancer Drugs . American Journal of PharmTech Research 2014.

INTRODUCTION

Drug use evaluation (DUE) or DU studies is a process which is ongoing, authorized and also a process of systematic quality improvement, which is specially designed to-

- Review of the drug use and/or patterns of prescription.
- Providing feedback of the results to the clinicians/physicians.
- Development of criteria and standards which gives a description of optimal drug use
- Promoting appropriate use of the drug via education and other interventions or means.

They also develop a relation of the number of cases of adverse effects with the number of patients who are exposed. Thus Drug use evaluation (DUE) enacts a prominent role in helping the health care system for understanding, analyzing, interpreting and to improve the prescription, administration and use of medications/drugs. The main aim of DU(drug use) research is to promote rational use of drugs, which allows prescribing of a well -documented drug in an optimal dose on the right indication, with accurate information and at an affordable and economic price.

Types of drug use information:

(i) Drug based information (ii) Problem based information (iii) Patient information (iv) Prescriber information

Sources of drug utilization data:

- 1) Computerized databases
- 2) Pharmacy Records
- 3) Medical Practitioner Records
- 4) Health Surveys

Instruments for data collection on drug utilization:

- 1) Patient files and computer registries
- 2) Home inventories
- 3) Questionnaires

Steps involved in conducting drug use study [2]:

Step 1- Identify drugs or therapeutic areas of practice for inclusion in the program

Step 2- Design of study

Step 3- Define criteria and standards

Step 4- Design the data collection form

Step 5-Data collection

Step 6- Evaluate results

Step 7-Provide feedback of results

Step 8- Development and implementation of interventions

Step 9- Re-evaluate to determine if drug use has improved

Step 10- Reassess and revise the DUE program

Step 11- Feedback results

Irrational use of the drug is a common problem all over the world. The constant increase in the number of medicines/drugs and options in the treatment provides an increase in the irrational medicine treatment encounters which finally result in poor patient outcome and much wastage of money and resources. The effect of inappropriate use of the medicine on the healthcare system is decrease in the quality of medicine therapy which leads to increased morbidity and mortality, enhanced therapy cost and enhanced risk of unwanted effects such as adverse drug reaction. Especially, in a developing country like India, irrational prescription is a common problem where this study of drug use evaluation can be useful. On realization of the importance of studies of drug utilization for creating a safe, effective and healthy healthcare system, various countries have initiated the concept of drug utilization review boards so as to provide information regarding drug utilization data at national level.

In India, mostly in the last two decades many efforts to study the drug utilization patterns have been initiated. Most of these groups are related to the department of pharmacology of medical institutions, colleges of pharmacy, newly initiated departments of pharmacy practice and other agencies. The data coming out from these studies has provided a way to study about various aspects of drug utilization all over the country. This has carved a niche for useful initiatives like providing education on the idea of restriction in the sale of antibiotics etc. Most of these studies of drug utilization have followed a very sound methodology, which takes a decision about the usefulness of the outcome.

The WHO (World health organization) has defined drug utilization as “a structured process which is used to assess the quality of drug therapy by engaging in the evaluation of data on drug prescribing, dispensing and/or patient use in a given health care environment against predetermined data, which is agreed upon with criteria and standards.

Cancer is known to be the 2nd leading cause of death in the developing countries. Cancer also known as Neoplasm is the appearance or development of a tumor. A tumor is an abnormal mass or piece of a tissue whose growth is found to be extreme and unstoppable or uncoordinated and continues or persists even after the cessation of the stimulus which gives rise to the change. Cancer

when once diagnosed, should be totally removed. Each and every cancerous cell must be killed since even one cell is capable of generating a newer neoplastic clone.

In all there are around 200 different types of cancer that affects the body of humans. A large or vast percentage of people will be affected by some form of cancer or other in their course of life. Some types of cancer are more dangerous and serious than others. Most of the cancers can be categorized as follows according to the National Cancer Institute.

There are generally 4 categories of cancer;

1.Carcinomas 2.Sarcomas 3.Leukemias 4.Lymphomas & Myelomas

1. Carcinomas: Cancer that originate in the skin or in the tissues that make a lining or a covering on the internal organs. Eg: Lung cancer.

2. Sarcomas: Cancers that originate in the cartilage, bone, muscle ,fat, blood vessels or other connective or supportive tissues. Eg: Ewings sarcoma.

3. Leukemias: Cancers that originate in tissues of blood-forming such as bone marrow & causes large amount of abnormal blood cells to be produced & enter the blood. Eg: Acute lymphoblastic leukemia.

4. Lymphomas & Myelomas: Cancers that originate in the immune system`s cells. Eg: Non Hodgkins lymphoma.

The human body constitutes of tiny cells where each of these cells constitutes of genes. Proteins which are comprised in these genes enact in regulating the division and multiplying of the cells. If a gene gets damaged the cells can grow and divide continuously without any restriction. If many of these cells which are damaged form and club together they can combine and develop to form a tumor.

The treatment of chemotherapy focuses on the use of medicine for weakening and destroying the cells of cancer in the body including cells of the original cancer site and any cancer cell which might have also spread to another part of the body. Chemotherapy is a systematic therapy which has an effect on the whole body by passing via blood stream. Chemotherapy can also have an unintentional harm on the other types of rapidly dividing cells possibly resulting in chemotherapy side effects.

Chemotherapy are generally of three types:

1. Neo adjuvant type, 2. Adjuvant type, 3. Palliative type.

- Neo adjuvant chemotherapy is given prior surgery to shrink the cancer so that the removal of the tissue will be less.

- Adjuvant chemotherapy is given after surgery for the reduction of the risk of reoccurrence.

• Palliative chemotherapy is used to put a control (but not cure) to the cancer in periodic sittings in which the cancer might be spreading beyond the localized lymph nodes and breast.

In many cases, chemotherapy medicines are given in combination which means you get 2-3 different medicines at the same time. These combinations are known as chemotherapy regimens and these can make the cancer shrink or disappear in about 30-60% of people treated.

As the treatment of cancer is very costly and chemotherapy results in many untoward effects so by studying the drug use evaluation of anti cancer drugs we could focus on the minimization of adverse reaction and also promotion of rational use of drugs.

Objectives:

To assess the rational and cost effective use of the drugs.

Specific Objective

1. To promote rational use of drugs.
2. To minimize adverse drug reaction.
3. To minimize anticipated drug interaction.
4. To minimize hospital stay
5. To provide feedback.

MATERIALS AND METHODS:

To achieve our objectives we have conducted this study in Yashoda Cancer Institute, Somajiguda, Hyderabad, Andhra Pradesh, which is a reputed hospital. Many patients from in and around AP visit here. We have approached the director of the hospital and procured proper approval from the management to carry out our study. It was conducted for over a period of 6 months in Yashoda Cancer Institute and Dr. Naidu N Bethune was attached to us for guidance, under his supervision and guidance this study was carried out. About 100 patients were surveyed, their case sheets were studied in detail. First we have designed a data collection form then approached the patients at their bedside(in patients), interacted with them, collected their respective data about their history of illness. Also studied their case sheets, their diagnosis were noted down, information about their laboratory tests, drugs prescribed, noted their progress. Timing of their intake of medications were also asked to the patients as well as their attenders. We also focused on different parameters like various class of drugs given to the patients, gender, age, route of administration, side effects.

Source of Information

A documented information was collected from the case sheets of respective wards, only in the presence of the concerned oncologist and the duty doctor , an ID (identity) number was given for

each patient.

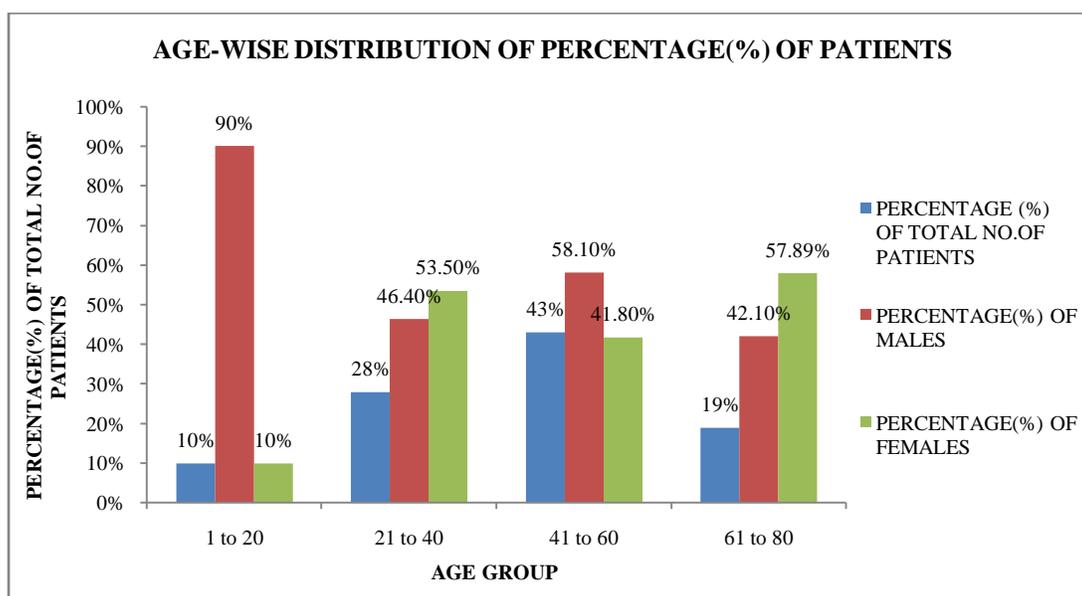
Data Collection

A total of 100 cases were reviewed and the analysis of forms was done accordingly. A written consent form was also attached with the data collection form. Signature of the patients were taken on the written consent form which included all the information regarding our study. The data collection form included the information as follows,

Patient ID (identity) no, Date of admission and reasons for admission, Age, Sex, History of cancer, Provisional diagnosis, Names of the drugs prescribed, Dose, route of administration, Duration
Data collection chosen must be familiar with how information is arranged in the patient's case sheet. Knowledge of drug names, strengths and the way orders are also important. Being final year pharmacy students it was an easy task for us and we could perform a proper analysis under the supervision of the respective oncologist.

RESULTS AND DISCUSSIONS:

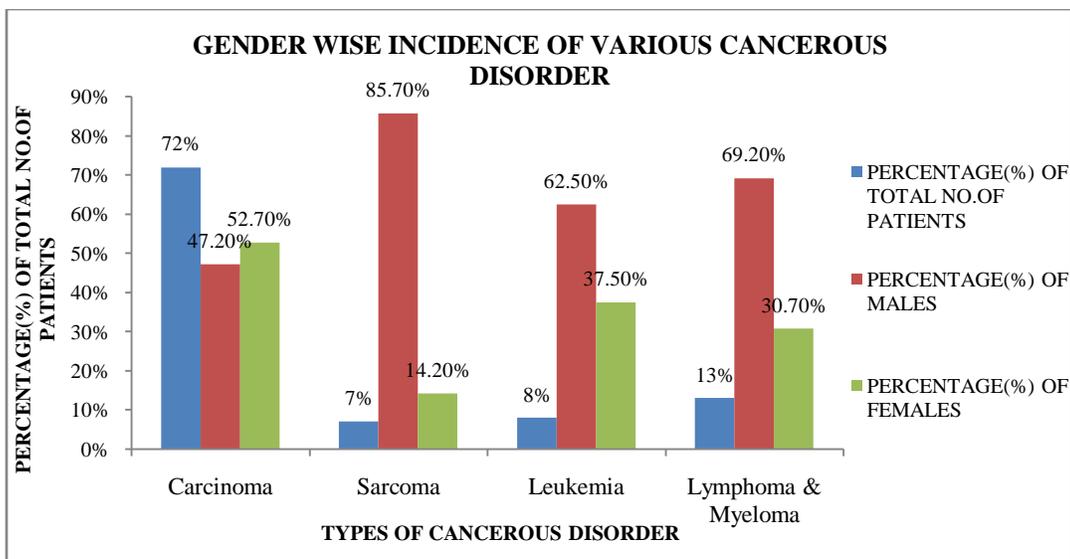
Prescriptions of 100 consecutive admissions were audited over a 6 month period to study drug utilization use of Anticancer drugs in Yashoda Cancer Institute, Hyderabad.



Graph-1: age-wise distribution of percentage(%) of patients:

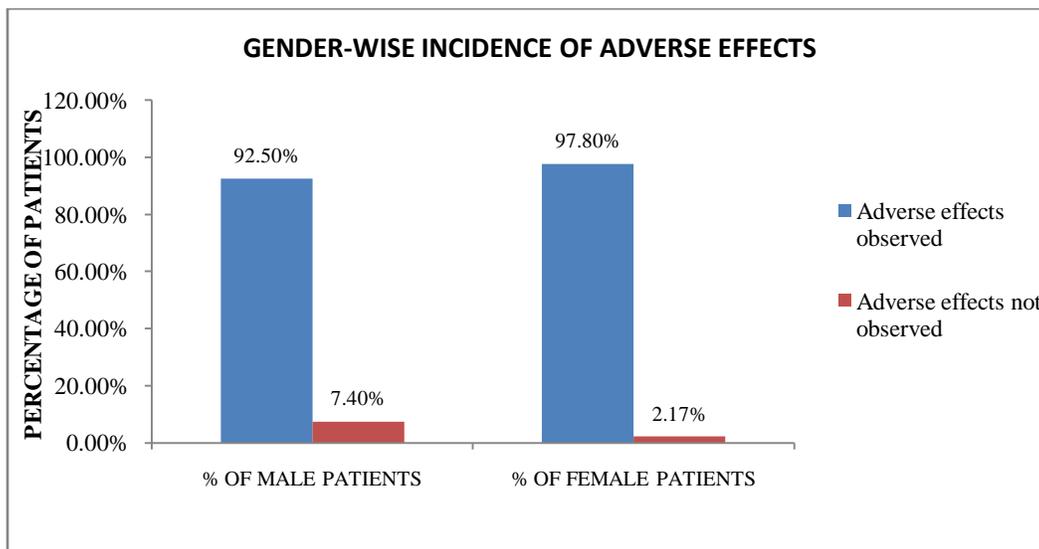
In our study male population was more, (54%) and (46%) of patients were found to be females and it was found that of all the patients enrolled patients were more prominent in 41– 60 age group where as less prominent in 1- 20 age group. On gender wise distribution of the patients males were more prominent in 1-20 age group and less prominent in 61-80 age group. Females were more prominent in 61-80 age group and less prominent in 1-20 age group.

In a similar study carried out by Ravi P. Shankar, K. Sen Pranab, Dinesh K. Upadhyay, Arun K. Dubey, P. Subish on drug utilization among surgical outpatients 54.3% patients were male, 44% were female while the sex was not written in 10 prescriptions and it was found that 29.6% were between the ages of 20 to 30 years.



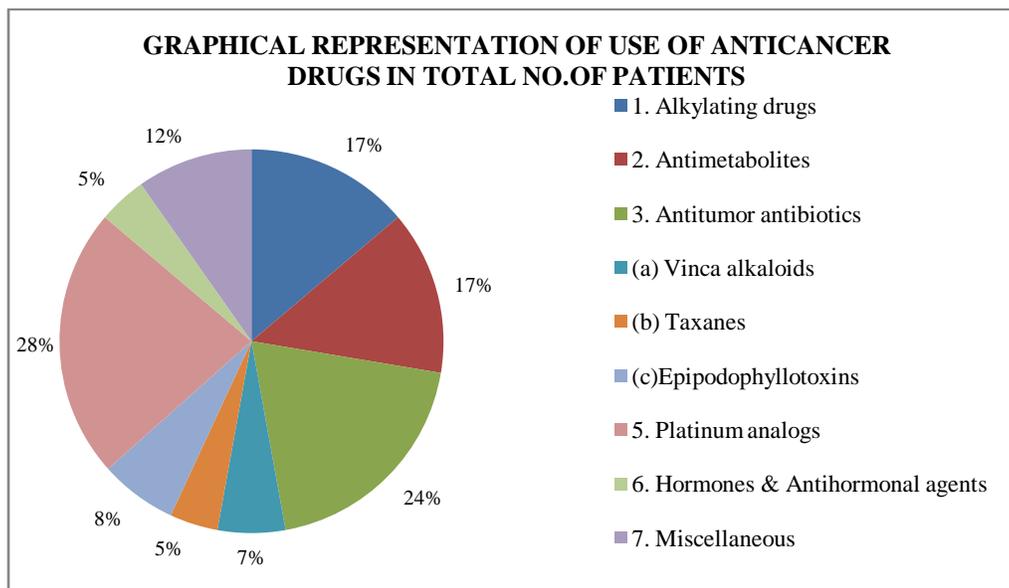
Graph-2: Gender wise incidence of various cancerous disorder:

Of all the cancers, Carcinoma was seen in 72% patients, Sarcoma in 7%, Leukemia in 8 % and Lymphoma in 13% patients. Carcinoma was found more in females (52.70%) than males(47.20%). Sarcoma, leukemia and lymphoma was found to be more prevalent in males 85.70%, 62.50%, 69.20% than females 14.20%, 37.50%, 30.70% respectively.



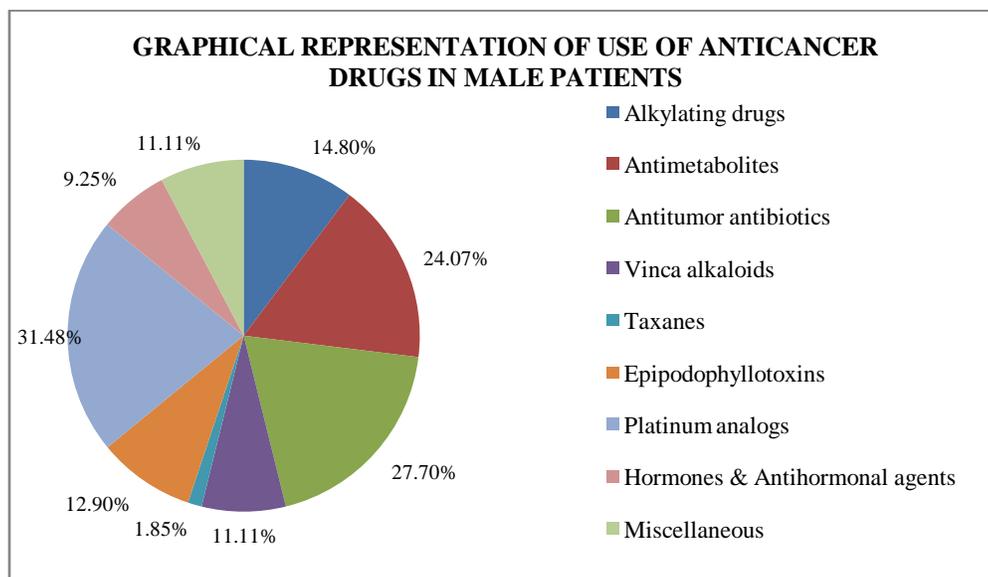
Graph-3: gender-wise incidence of adverse effects:

Side effects were observed in almost all the patients among which Nausea, Vomiting, Alopecia, Darkening of skin were commonly seen. Females (97.80%) expressed more adverse effects than males(92.50%).

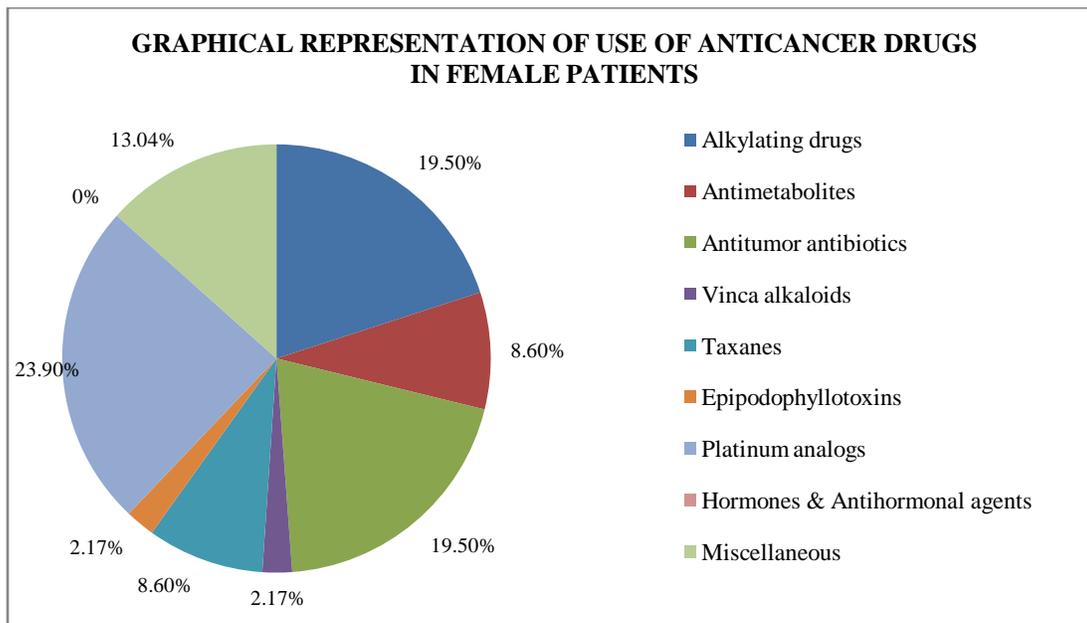


Graph-4: graphical representation of use of anticancer drugs in total no.of patients:

The class of drugs which were more frequently used were Platinum analogues(17%) and less frequently were Taxanes (5%). Lung cancer and Breast cancer were seen in most of the cases. Route of administration of anticancer drugs was mainly through intravenous route in all the patients, where as other drugs like anti emetics, anti ulcers and multivitamins were given orally. Among the different categories of anti cancer drugs used in this hospital we found that platinum analogues were mostly prescribed both in males and females.

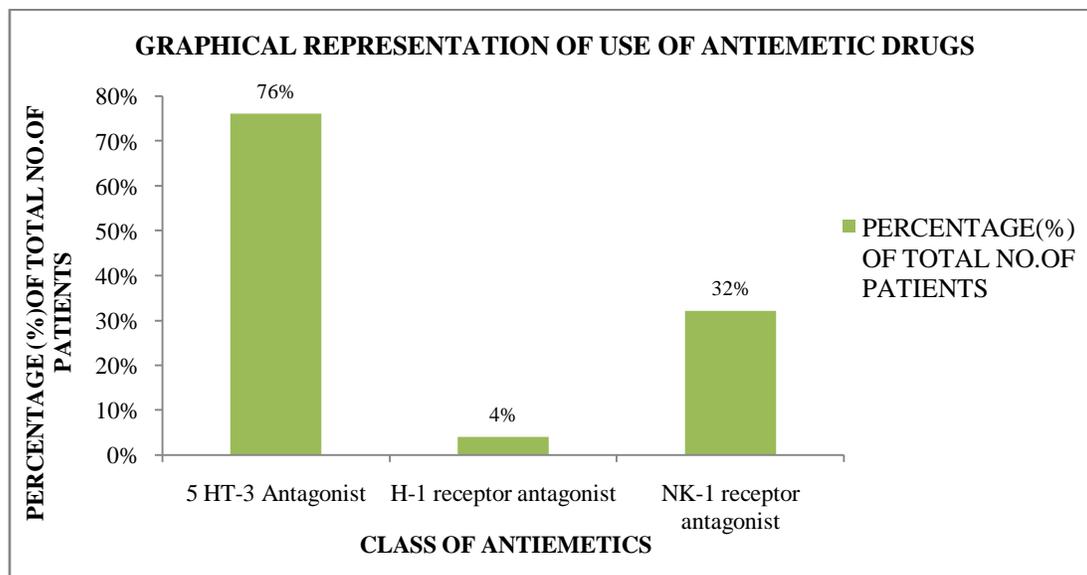


Graph-5: Graphical representation of use of anticancer drugs in male patients:

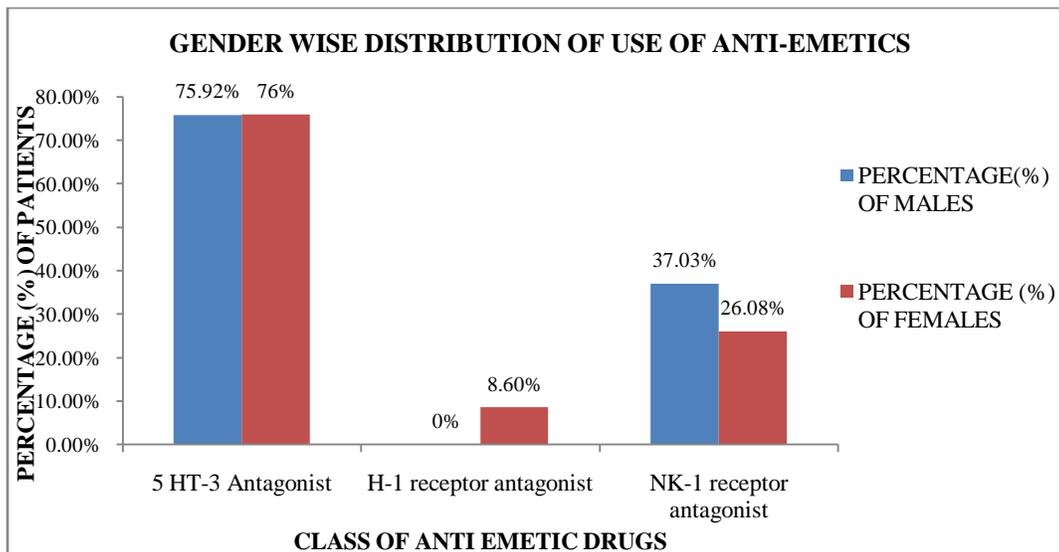


Graph-6: Graphical Representation Of Use Of Anticancer Drugs In Female Patients:

Nausea and vomiting are the most common adverse effects which are observed in the residing patients so to subside this adverse effect the most common anti-emetic prescribed was 5HT-3 (5Hydroxytryptamine-3) receptor antagonist (76%) where as the least commonly prescribed anti-emetic was H-1 (Hydroxytryptamine-1) receptor antagonist (4%) when taken total patient population into consideration



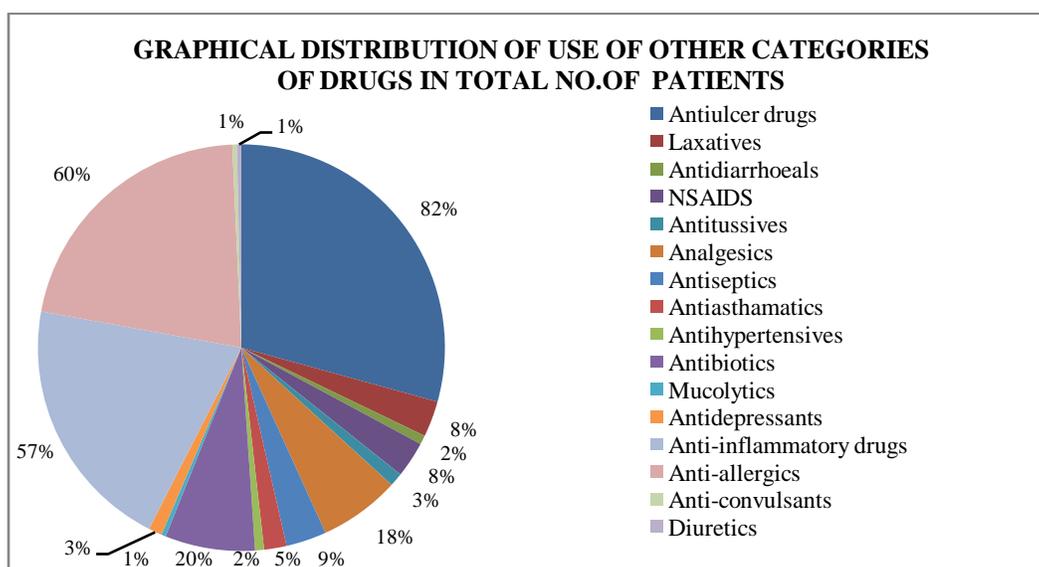
Graph-7: Graphical representation of use of antiemetic drugs:



Graph-8: Gender wise distribution of use of anti-emetics:

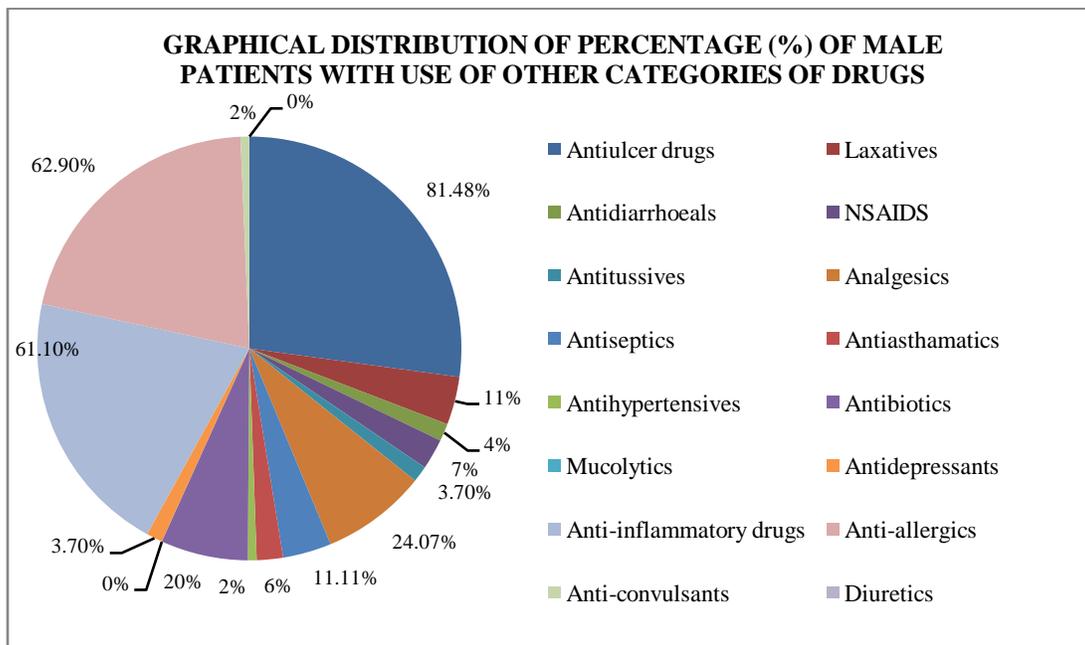
In males the most commonly prescribed anti-emetic was 5 HT-3 (5 Hydroxytryptamine-3) Antagonist (75.92%) where as the least commonly prescribed anti-emetic was H-1 (Hydroxytryptamine-1) receptor antagonist(0%), in females the most commonly prescribed anti-emetic was 5 HT-3 (5 Hydroxytryptamine-3) Antagonist (76%) followed by NK-1 (Neurokinin-1) receptor antagonist (26.08%), H-1 (Hydroxytryptamine-1) receptor antagonist (8.60%).

The other categories of drugs prescribed here were Anti-ulcer drugs (82%) , Anti-allergics (60%), Anti-inflammatory drugs (57%), Antibiotics (20%), Analgesics(18%), Antiseptics(9%), NSAIDS(8%), Laxatives(8%), Antiasthmatics (5%), Antitussives (3%), Antidepressants(3%), Antidiarrhoeals (2%), Antihypertensives (2%), Mucolytics (1%), Anti-convulsants (1%), Diuretics (1%) in total patients

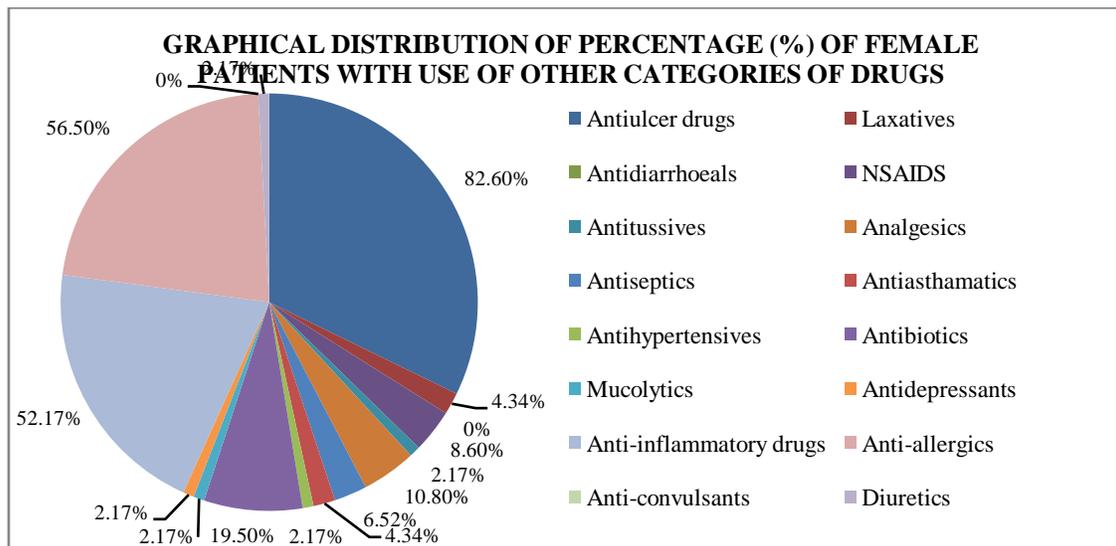


Graph-9: Graphical distribution of use of other categories of drugs in total no. Of patients:

In both males and females of the other category of drugs prescribed anti ulcer drugs occupied the largest number.



Graph- 10: Graphical distribution of percentage (%) of male patients with use of other categories of drugs:



Graph- 11: Graphical distribution of percentage (%) of female patients with use of other categories of drugs:

ROLE OF PHARMACIST:

Possible roles for pharmacists in DUE (Drug use evaluation)

- Program development, supervision and coordination
- Education of hospital staff about DUE(Drug use evaluation)

- Promotion of goals and objectives of DUE(Drug use evaluation)
- Presentation of DUE (Drug use evaluation) results at meetings and conferences
- Publication of results in peer-reviewed journals.

Physicians are often put forward as the ultimate pathway for nearly all professional decisions about using the resources of health. Yet with regard to the drugs, in many cases pharmacists are the final link between the drug/medication and the patient. In some cases a board of drug utilization review makes it compulsory that pharmacists interact with people when new medications are prescribed to them. This won't stop all the dangerous and life-threatening interactions unless patients openly speak about what other drugs they are taking. Pharmacists can also conduct a retrospective DUR (Drug use review) in order to evaluate what medicines/ drugs a patient is taking at present, and thus make alterations if needed to more effective or more appropriate drugs.

Pharmacy is an important part of the health care delivery system and will have an influence and hopefully will also influence -events occurring within the health care system. The aim of pharmaceutical care for providing optimal drug therapy and also to reduce problems of drug usage in the society

NATIONAL LIST OF ESSENTIAL MEDICINES

1. Bleomycin
2. Cisplatin
3. Cyclophosphamide
4. Daunorubicin
5. Dacarbazine
6. Doxorubicin
7. Etoposide
8. 5FU(5-fluorouracil)
9. Hydrocortisone
10. Gemcitabine hydrochloride
11. Methotrexate
12. Prednisolone
13. Paclitaxel
14. Vinblastine
15. Vincristine

CONCLUSION:

We conclude that the use of anti cancer drugs was almost found to be rational. In this hospital 25 different drugs were prescribed out of which 14 are from National List of Essential Drugs. Rational use of drugs minimizes polypharmacy , drug interactions in turn it minimizes the hospital stay. The prescribing habits are appropriate and are in accordance with W.H.O. guidelines. Pharmacist is the key person for better management of therapy based on stage and condition of patient. Our aim in choosing this topic is to give a brief idea about the threatful disease Cancer and highlight the rational and cost effective use of the Anti Cancer Drugs.

REFERENCES:

1. WHO Expert Committee. The Selection of Essential Drugs, Technical Report Series no. 615. Geneva: World Health Organization, 1977
2. R.K.Goyal, Anitha A Mehta,. R.Balaraman, Derasari and Gandhi's Elements of Pharmacology, Pg no:54
3. .Rang HP, Dale M M, Ritter J M, Moore P K ,Text book of pharmacology.5th edition. Edinburgh: Churchill living stone;2003
4. A.R. Paradkar, Hospital and Clinical Pharmacy, Nirali Prakasham publishers
5. Croce CM(January 2008)."Oncogenes and Cancer". The New England journal of medicine 358(5):502-11.doi:10.1056/NEJMra072367.PMID 18234754
6. Goodman and Gilman's-The Pharmacological basis of therapeutics-19th edition:404-406
7. Nandakumar A. National Cancer registry Program, Indian Council of Medical Research, Consolidated report of the population based cancer registries, New Delhi,India:1990-96.
8. Dinshaw KA, Rao DN, Ganesh B. Tata Memorial Hospital Cancer Registry Annual Report,Mumbai,India:1999.
9. Einarson T. Pharmcoepidemiology. In: Parthasarathi G, Hansen KN, Nahata MC, editors. A Text book of Clinical Pharmacy Practice essential concepts and skills. 1st ed., Hyderabad: Universities Press (India) Limited; 2008:405-23.
10. Sathvik B. Drug use evaluation. In: Parthasarathi G, Hansen KN, Nahata MC, editors. A Text book of Clinical Pharmacy Practice essential concepts and skills. 2nd ed., Hyderabad: Universities Press (India) Limited; 2012:460

AJPTR is

- Peer-reviewed
- bimonthly
- Rapid publication

Submit your manuscript at: editor@ajptr.com

