Summer Training at

Cadila Pharmaceutical Limited

(April 23-May30, 2012)

Doctors Perception Regarding Newly Launched Drug Mycidac and Cadicrit

By

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Under the guidance of

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CERTIFICATE

This is to certify that Miss Anjali Sethi has undergone summer training at CADILA Pharmaceuticals Limited, Ahmedabad from 25th April to 30th May 2012.

The candidate carried out all the studies related to summer internship herself. Her approach to the studies has been sincere, scientific, and analytical. This summer training in partial fulfillment of the course requirement is recommended for the award of Post Graduate Diploma in Pharmaceutical Management.

I wish her success in all future endeavors.

Dr.P.R.Sodani

(Dean Academics and Student Affairs)

(Mentor)

PREFACE

PREFACE

As a part of my academic curriculum, I am required to undergo summer training in any organization at the end of the first year. The main objective of the training is to translate the theoretical knowledge into practical life and to know what are the challenges faced by the organization & how they tackle this problem. Knowledge is burden unless it is translated into practical experience. The basic purpose of the project is to explore the treatment preferences of oncologists for managing non small cell lung cancer and Nephrologists for managing Chronic Renal Failure or Chronic Kidney Failure. To make doctors aware regarding newly launched drugs Mycidac and Cadicrit.As far as selection of the organization is concerned I got the opportunity in Cadila Pharmaceutical Limited. This project has helped me a lot in understanding the various aspect of the product management team. I hope that this knowledge will prove beneficial for me in future also.

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT:

My sincere thanks to all those who have been the driving force behind the successful completion of my internship. Firstly, I would like to thank Dr.S.D Gupta (Director) and Brig.S.K.Puri (Dean) for care and support during the course. I m also grateful to PGDHM office especially Mr.Dalbir Singh for helping me in getting the internship in desired organization.

Working on this project proved to be the lifetime experience for me. In the preparation of this project report, which is a part of my Summer Internship Programme, I have put in substantial effort and at the same time I found it pleasurable doing the same. I take this opportunity to express my sincere gratitude to Mr.Abhijit Patil (Product Manager-Oncocare) for providing me the opportunity to work with him in an esteemed organization like Cadila Pharmaceutical Limited. He contributed in a substantial way during all stages of the preparation of this report. His guidance at every stage of the project enabled me to successfully complete this project, which otherwise would not have been possible without his constant encouragement and motivation of this project.

I also thank full to Mr Roshan Paul(GM of Sales &Marketing of Oncocare).I am also thankful to all the doctors to whom I interacted with, for their invaluable time and consent to talk to me.

Furthermore, completion of this project report was not possible without the valuable suggestion of my faculty mentor Mr.P.R.Sodani (Dean of training, Prof. Pharmacoeconomics), whose guidance helped me to sail through many hurdles, I m sincerely thankful to him.

Last but surely not the least from the bottom of my heart I wish to thank my Family for supporting and guiding me for completion of this project. I also express my thanks to my colleagues who have directly and indirectly guided me with moral support to work on this project. Without their support and encouragement I would have not attained all that I have so far. I hope I have lived up to their expectations.

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EXECUTIVE SUMMERY

Executive Summery

I worked on the project titled a study on doctor's perception regarding newly launched drug Mycidac & Cadicrit, under guidance of Mr Abhijit Patil. Under this I surveyed 2 major cities namely Jaipur and Ahmedabad. The sample size consisted of 49 doctors in which 36 were Oncologists and 13 were Nephrologists. A closed-ended and open-ended questionnaire was used to acquire this data. The study was conducted mainly to know the prescribing patterns, line of treatment, or treatment preferences, and awareness of Nephrologists and Oncologists .This study was also conducted to aware the Nephrologists and Oncologists regarding newly launched drug Mycidac and Cadicrit from the Oncocare division of Cadila Pharmaceutical Limited. A number of important results were drawn out after the data analysis. This gives a brief idea about the line of treatment of Oncologists and Nephrologists, and their treatment preferences, awareness of particular drug that is Mycidac which is used in treatment of Non small cell lung cancer & Cadicrit which is used for treatment of chronic kidney failure or chronic renal failure. The important conclusions derives at the end of this survey were, all the oncologists prescribe according to potency of molecule, cost effectiveness, and safety to patients. As clinical trials of Mycidac shows improved progression free survival and improved overall survival so maximum doctors were agreed with it and they will happy to pass this benefit to their patients having non small cell lung cancer. Line of treatment of all Nephrologists is same &they all prescribe according to potency of molecule, cost effectiveness and safety of the patient.

COMPANY'S PROFILE

Company's Profile:-

Cadila Pharmaceuticals Ltd. is one of the largest privately held pharmaceutical companies in India, headquartered at Ahmedabad, in the state of Gujarat. Over the last five decades, it has been developing and manufacturing pharmaceutical products and selling and distributing these in over 50 countries around the world. An integrated healthcare solutions provider with pharmaceutical product basket, it caters to over 50 therapeutic areas that include cardiovascular, gastrointestinal, analgesics, haematinics, anti-infectives and antibiotics, respiratory agents, antidiabetics and immunologicals. The company focuses on providing high quality, appropriately priced products to its customers and supports all these with dedicated customer service. Cadila Pharmaceuticals has a multicultural, multilingual and multinational workforce of more than four thousand employees including over two hundred people outside India in forty-nine countries of Africa, CIS, Japan and USA.Company have one of the best Research and Development setups in India, manned by more than three hundred and fifty scientists and engineers from various disciplines including biology, pharmacology, clinical research, chemistry, toxicology, phytochemistry and different disciplines of engineering. Which forms the backbone of Company's state-of-the-art manufacturing facilities – conforming to the most stringent international cGMP norms – at Dholka, Ankleshwar, Kadi and Hirapur in Gujarat; Samba in Jammu & Kashmir; and Addis Ababa in Ethiopia. The company also participates in Public-Private partnerships for developing diagnostic, preventive and curative pharmaceutical and diagnostic products.

Cadila Pharmaceuticals is the first Indian company to get IND approval by USFDA for clinical trials to be conducted in India. Subsequently, the company has filed four more INDs with USFDA. Of the five INDs filed, one is for pulmonary tuberculosis; the trial is supported by Department of Biotechnology, Govt. of India. The remaining four are for various types of cancers, e.g., Lung Cancer, Prostrate cancer, Bladder Cancer and Melanoma. Thus all the INDs are for providing solutions to major global health care problems. The clinical trials on prostrate cancer, Lung cancer and Bladder cancer are supported by Department of Science and Technology to encourage innovations.

The company has state-of-the-art manufacturing facilities conforming to the most stringent international cGMP norms in comparison with WHO-GMP, WHO, Geneva (GDF site for Anti- TB), TGA Australia (PIC/S), USFDA, UK- MHRA, MCC-South Africa, ISO 9001 and ISO 14001. Spread over hundred acres of land, Cadila Pharmaceuticals' manufacturing facility at Dholka is the cynosure of all eyes, well equipped with world-class production facilities. The company's two Active Pharmaceutical Ingredients units at Ankleshwar manufacture a wide-range of APIs and intermediates including three USFDA certified products. The manufacturing facility at Samba, near Jammu, started its commercial operations in August 2006. The first overseas formulation manufacturing facility of Cadila Pharmaceuticals Ltd. has commenced its operations in Ethiopia.

Specialties

Company's specialties are Pre-Clinical Trials, Clinical Trials, Research & Development, Formulation & Development, Production and Marketing of Drugs.

Vision

Company's vision is to be a leading pharmaceutical company in India and to become a significant global player by providing high quality, affordable and innovative solutions in medicine and treatment.

Mission

Company's mission is to discover, develop and successfully market pharmaceutical products to prevent, diagnose, alleviate and cure diseases.

It always provide total customer satisfaction and trying to achieve leadership in chosen markets, products and services across the globe, through excellence in technology, based on world-class research and development.

Company always responsible to the society, and will be driven by high ethical standards in practices.

Objectives:-

- To explore the treatment preferences of oncologists for managing non small cell lung cancer and Nephrologists for managing Chronic Renal Failure or Chronic Kidney Failure.
- To make doctors aware regarding newly launched drugs Mycidac and Cadicrit.

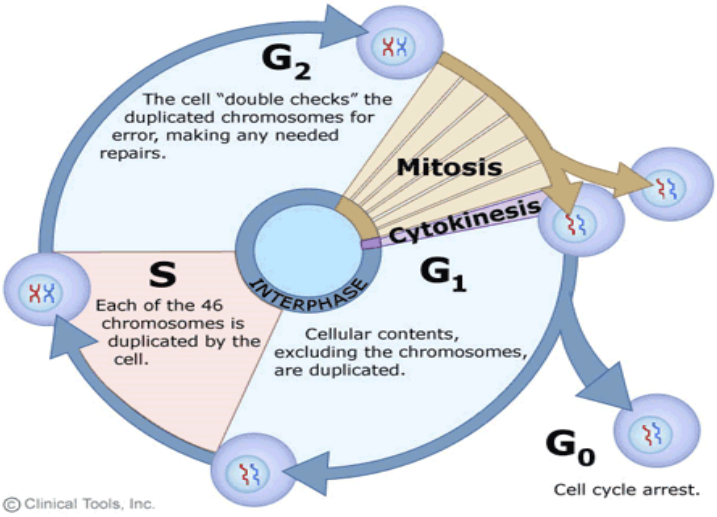
INTRODUCTION

Introduction:

Cancer:

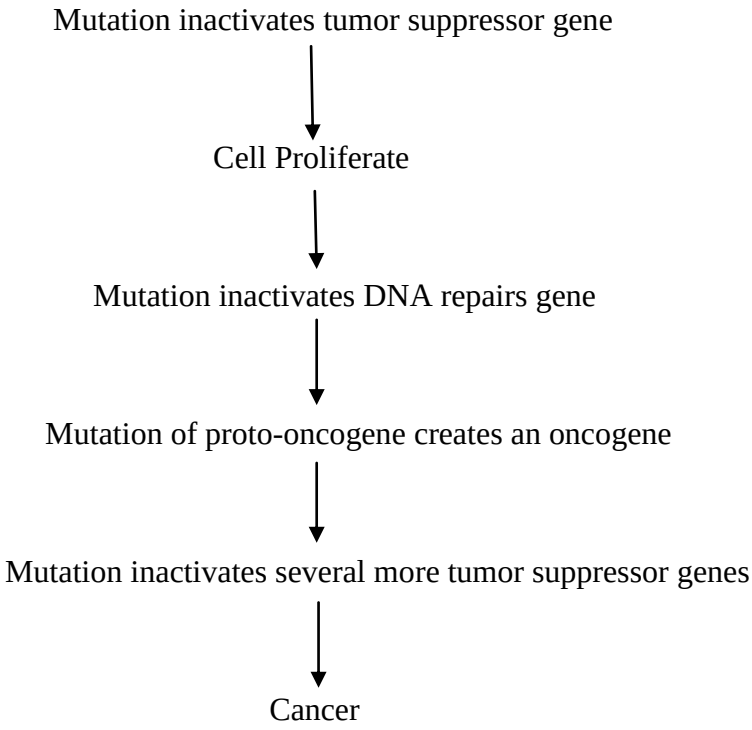
Cancer or malignant neoplasm is a class of diseases in which a group of cells display uncontrolled growth, invasion (intrusion on and destruction of adjacent of adjacent tissues), and sometimes metastasis (spread to other locations in the body via lymph or blood).These properties of malignant cancers differentiate them from benign tumors, which are self limited and do not invade or metastasize. Most cancers form a tumor but some, like leukemia, do not. This branch of medicine concerned with the study, diagnosis, treatment, and prevention of cancer is known as Oncology. All cancers are caused by abnormalities in the genetic material of the transformed cells. These abnormalities may be randomly acquired through errors in DNA replication, or are inherited, and thus present in all cells from birth. The heritability of cancers is usually affected by complex interactions between carcinogens and the host's genome. New aspects of the genetics of cancer pathogenesis, such as DNA methylation, and microRNAs are increasingly recognized as important. Genetic abnormalities found in cancer typically affect two general classes of genes.Cancer promoting oncogenes are typically activated in cancer cells ,giving those cells new properties ,such as hyperactive growth and division ,protection against programmed cell death,loss of respect for normal tissue boundaries ,and the ability to become established in diverse tissue environments.Tumor suppressor genes are inactivated in cancer cells, resulting in the loss of normal functions in those cells such as accurate DNA replication ,control over the cell cycle, orientation and adhesion within tissues and interaction with protective cells of the immune system.

Cell Cycle:



State	Phase	Abbreviation	Description
Quiescent /senescent	Gap 0	G0	A resting phase where the cell has left the cycle and has stopped dividing.
Interphase	Gap1	G1	Cells increase in size in Gap1.The G1 checkpoint control mechanism ensures that everything is ready for DNA synthesis.
	Synthesis	S	DNA replication occurs during this phase.
	Gap2	G2	During the gap between DNA synthesis and mitosis, the cell will continue to grow. The G2 checkpoint control mechanism ensures that everything is ready to enter the M (mitosis) phase and divide.
Cell division	Mitosis	M	Cell growth stops at this stage and cellular energy is focused on the orderly division into two daughter cells. A check point in the middle of mitosis (Metaphase Checkpoint) ensures that the cell is ready to complete cell division.

Mechanism:



Types:

- **Bladder Cancer:-**
  Cancer that forms in tissues of the bladder .Most bladder cancers are transitional cell carcinomas(cancer that begins in cell that normally make up the inner lining of the bladder).other types include squamous cell carcinoma.(cancer cell that begins in thin ,flat cells) and adenocarcinoma(cancer that begins in cells that make and release mucus and other fluids).The cells that form squamous cell carcinoma and adenocarcinoma develop in the inner lining of the bladder as a result of chronic irritation and inflammation.
- **Breast Cancer:-**
  Cancer that forms in tissues of the breast, usually the ducts (tubes that carry milk to the nipple)and lobules(glands that make milk).It occurs in both men and women, although male breast cancer is rare.
- **Colon and Rectal Cancer:-**
  Cancer that form in tissues of the colon (the longest part of the large intestine)is known as Colon Cancer. Most colon cancers are adenocarcinomas(cancers that begin in cells that make and release mucus and other fluids).Cancer that forms in the tissues of the rectum (the last several inches of the large intestine closest to the anus).
- **Endometrial Cancer:-**

Cancer that forms in the tissues lining the uterus (the small, hollow, pear-shaped, organ in a women's pelvis in which a fetus develops).Most endometrial cancers are adenocarcinomas (cancers that begin in cells that make release mucus and other fluids).

- **Kidney (Renal Cell)Cancer:-**
  Cancer that forms in tissues of the kidneys.kidney cancer includes renal cell carcinoma (cancer that forms in the lining of very small tubes in the kidney that filter the blood and remove waste products) and renal pelvis carcinoma (cancer that forms in the center of the kidney where urine collects).It also includes Wilms tumor, which is a type of kidney cancer that usually develops in children under the age of 5.
- **Lung Cancer :-**
  Cancer that forms in tissues of the lung, usually in the cells lining air passages. The two main types are small cell lung cancer and non-small cell lung cancer .These types are diagnosed based on how the cells look under a microscope.
- **Melanoma:-**
  A form of cancer that begins in melanocytes (cells that make the pigment melanin).It may begins in a mole (skin melanoma),but can also begin in other pigmented tissues, such as in the eye or in the intestines.
- **Lymphoma:-**
  Lymphoma is a cancer that begins in the lymphocytes of the immune system and presents as a solid tumor of lymphoid cells. They often originate like balls in lymph nodes, presenting as an enlargement of the node (a tumor).There are many types of lymphomas. However, most common are Hodgkin's lymphoma and Non-Hodgkin lymphoma (NHL).
- **Leukemia:-**
  Cancer that starts in blood-forming tissues such as the bone marrow and causes large numbers of blood cells to be produced and enter the bloodstream. It is a cancer of the blood or bone marrow and is characterized by an abnormal proliferation (production by multiplication)of blood cells, usually white blood cells(leukocytes)Leukemia is a broad term covering a spectrum of diseases.Leukemia is clinically and pathologically subdivided into two main groups are Acute Leukemia and Chronic Leukemia.
- **Pancreatic Cancer:-**
  A disease in which malignant (cancer) cells are found in the tissues of the pancreas. Also called exocrine cancer.
- **Prostate Cancer:-**
  Cancer that forms in tissues of the prostate (a gland in the male reproductive system found below the bladder and in front of the rectum).Prostate cancer usually occurs in older men.
- **Thyroid Cancer:-**
  Cancer that forms in the thyroid gland (an organ at the base of the throat that makes hormones that help control heart rate ,blood pressure ,body temperature ,and weight).Four main types of the thyroid cancer are papillary,follicular,medullary,and anaplastic thyroid cancer.

- **Skin Cancer:-**

  Cancer that forms in the tissues of the skin. There are several types of skin cancer. Skin cancer that forms in melanocytes (skin cells that make pigment) is called melanoma. Skin cancer that forms in basal cells (small, round cells in the base of the outer layer of the skin)is called basal cell carcinoma. Skin cancer that forms in squamous cells (flat cells that form the surface of the skin) is called squalors cell carcinoma. Skin cancer that forms in neuroendocrine cells (cells that release hormones in response to signals from the nervous system) is called neuroendocrine carcinoma of the skin. Most skin cancers form in older people on parts of the body exposed to the sun or in people who have weakened immune systems.

  ## Treatment:-

  Complete removal of the cancer without damage to the rest of the body is the goal of treatment. Sometimes this can be accomplished by surgery, but the propensity of cancers to invade adjacent tissues or to spread to distant sites by microscopic metastasis often limits its effectiveness. The effectiveness. The effectiveness of chemotherapy is often limited by toxicity to other tissues in the body. Radiation can also cause damage to normal tissue. Cancer can be treated by surgery, radiation therapy, chemotherapy, immune therapy, targeted therapies, hormonal therapy, angiogenesis inhibitor, symptom control. The choice of therapy depends upon the location and grade of the tumour and the stage of the disease, as well as the general state of the patient (performance status).

- **Surgery:-**

  In theory, non –haematological cancers can be cured if entirely removed by surgery but this is not always possible. When the cancer has metastasized to other sites in the body prior to the surgery, complete surgical excision is usually impossible.

  Eg:-breast cancer

  In addition to removal of the primary tumor, surgery is often necessary for staging.

  Eg:-determining the extent of the disease and whether it has metastasized to regional lymph nodes. Staging is a major determinant of prognosis and of the need for adjuvant therapy. Occasionally, surgery is necessary to control symptoms, such as spinal cord compression or bowel obstruction. This is reffered to as palliative treatment.

- **Radiation Therapy:-**

  Radiation therapy (also called radiotherapy-ray therapy or irradiation) is the use of ionizing radiation to kill cancer cells and shrinks tumors.Radiation therapy can be administered externally via externally via external beam radiotherapy (EBRT) or internally via brachytherapy.The effects of radiation therapy are localised and confined to the region being treated. Radiation therapy are localised and confined to the region being treated. Radiation therapy injures or destroys cells in the area being treated (target tissue) by damaging their genetic material, making it impossible for these cells to continue to grow and divide. Although radiation damages both cancer cells and normal cells, most normal cells can recover from the effects of radiation and function properly. The goal of radiation and function properly. The goal of radiation therapy is to damage as many cancer cells as possible, while limiting harm to nearby healthy tissue.Hence, it is given in many fractions, allowing healthy

tissue to recover between fractions. Radiation therapy may be used to treat almost every type of solid tumor, including, including cancers of the brain,breast,cervix,larynx,lung,pancreas,prostate,skin,stomach,uterus,or soft tissue sarcomas. Radiation therapy may be used to treat leukemia and lymphoma.Radiation does to each site depends on a number of factors, including the radio sensitivity of each cancer type and whether there are tissues and organs nearby that damaged by radiation. Thus as with every form of treatment, radiation therapy is not without its side effects.

- **Chemotherapy:**
  Chemotherapy is the treatment of cancers with drugs (anticancer drugs) that can destroy cancer cells. In current usage, the term "chemotherapy" usually refers to cytotoxic drugs which affect rapidly dividing cells in general, in contrast with targeted therapy. Chemotherapy drugs interfere with cell division in various possible ways, eg.with the duplication of DNA or the separation of newly formed chromosomes. Most forms of chemotherapy target all rapidly dividing cells and are not specific to cancer cells, although some degree of specificity may come from the inability of many cancer cells to repair DNA damage, while normal cells generally can.Hence, chemotherapy has the potential tissue, especially those tissues that have a high replacement rate (eg.intestinal lining).These cells usually repair themselves after chemotherapy. Because some drugs work better together than alone, two or more drugs are often given at the same time. This is called "combination chemotherapy", most chemotherapy regimens are given in a combination. The treatment of some leukemias and lymphomas requires use of high dose chemotherapy, and total irradiation (TBI).This treatment ablates the bone marrow, and hence the body's ability to recover and repopulate the blood. For this reason, bone marrow, or peripheral blood stem cell harvesting is carried out before the ablative part of therapy, to enable rescue after the treatment has been given. This is known as autologous stem cell transplantion.Alternatively, hematopoietic stem cell may be transplanted from a matched unrelated donor (MUD)
- **Targeted Therapies:**
  Targeted therapy, which first became available in the late in late 190s, has had a significant impact in the treatment of some types of cancer and is currently a very active active research area. This constitutes the use of agents specific for the deregulated proteins of cancer cells. Small molecule targeted therapy drugs are generally inhibitors of enzymatic domains on mutated, overexpressed, or otherwise critical proteins within the cancer cell. Prominent examples are the tyrosine kinase inhibitors imatinib and gefitinib.
  Monoclonal antibody therapy is another strategy in which the therapeutic agent is an antibody which specifically binds to a protein on the surface of the cancer cells.eg includes the anti-HER2/neu antibody Herceptin used in breast cancer and the anti-CD20 antibody rituximab, used in a variety of B-cell malignancies.
  Targeted therapy can also involve small peptides as homing devices which can bind to cell surface receptors or affected extracellular matrix surrounding tumor. Photodynamic therapy (PDT) is a ternary treatment for cancer involving a photosensitizer, tissue oxygen, and light. And also in basal cell carcinoma.
- **Immunotherapy:-**

Cancer immunotherapy refers refers to a diverse set of therapeutic strategies designed to induce the patient's own immune system to fight the tumor. Contemporary methods for generating immune response against tumors include intravesical BCG immunotherapy for the superficial bladder cancer and use of interferons and other cytokines to induce an immune response in renal cell carcinoma and melanoma patients. Vaccines to generate specific immune responses are the subject of intensive research for a number of tumors,notably malignant melanoma and renal cell carcinoma.

- **Hormonal Therapy:-**
  The growth of some cancers can be inhibited by providing or blocking certain hormones. Common examples of hormone-sensitive tumors include certain types of breast and prostate cancers. Removing or blocking estrogen or testosterone is often an important additional treatment. In certain cancer, administration of hormone antagonists, such as progestogens may be therapeutically beneficial.
- **Angiogenesis Inhibitors:-**
  Angiogenesis inhibitor s prevents the extensive growth of blood vessels that tumors require to survive. Some, such as bevacizumab, have been approved and are in clinical use. One of the main problems with anti-angiogenesis drugs is that many factors stimulate blood vessels growth in cells normal or cancerous.Anti angiogenesis drugs only target one factor, so the other factors continue to stimulate blood vessel growth.

- **Symptom Control:-**
  Although the control of the symptoms of cancer is not typically thought of as a treatment directed at the cancer, it is an important determinant of the quality of the life of cancer patients, and plays an important role in the decision whether the patient is able to undergo other treatments. Although doctors generally have the therapeutic skills to reduce pain, nausea, vomiting, diarrhea, hemorrhage and other common problems in cancer patients, the multidisciplinary specialty of palliative care has arisen specifically in response to the symptom control needs of the group of patients.

Cancer Chemotherapeutic Agents

- Agents which stops the multiplication of cancer cells.
- Most of the drugs are antiproliferative and damage DNA which leds to apoptosis.
- Also affect a normal cell that leads to depression of blood marrow, impairment of healing, depression of growth, sterilization and hair loss, teratogenecity, nausea and vomiting.

Classification of Chemotherapeutic Agent:-

I. Alkylating Agent.

Alkylating agents are so named because of their ability to add alkyl groups to many electronegative groups under conditions present in cells. They impair cell function by forming covalent bonds with the amino, carboxyl, sulfydryl and phosphate groups.

a) Nitrogen mustards
   - Cyclophosphamide
   - Estramustine
   - Melphalan

- Chlorambucil

b) Nitrosource
   - Lomustine
   - Carmustine

c) Busulphan
d) Platinum containing
   - Cisplatin
   - Carboplatin
   - Oxaliplatin

e) Dacarbazine

II. Antimetabolites

Antimetabolites masquerade as purine or pyrimidine which become the building blocks of DNA They prevent these substances from becoming incorporated into DNA during the S phase ,stopping normal development and division .They also prevent RNA synthesis.

a) Folate antagonist
   - Methotrexate

b) Pyrimidine analogues
   - Flurouracil
   - Cytarabine
   - Gemcitabine

c) Purine analogues
   - Fludarabine
   - Pentostatin
   - Cladribine
   - Mercaptopurine
   - Tioguanine

III. Anti –Tumor Antibiotics

These include the immunosuppressant dactinomycin, doxorubicin, epirubicin, bleomycin and others.

a) Anthracyclines
   - Doxorubicin
   - Idarubicin
   - Epirubicin
   - Aclarubicin
   - Mitoxantrone

b) Dactinomycin
c) Bleomycins
d) Mitomycin
e) Procarbazine
f) Hydroxycarbamide

IV. Plant Alkaloids

These alkaloids are derived from plants and block cell division by preventing microtubule function. Microtubules are vital for cell division, and without them, cell division, and without them, cell division cannot occur. The main examples are vinca alkaloids and taxanes.

a) Vinca alkaloids
   - Vincristine
   - Vinblastine
   - Vindesine
   - Vinorelbine

b) Taxanes
   - Docetaxel
   - Paclitaxel

c) Etoposide

d) Campothecins
   - Irinotecan
   - Topotcan

V. Hormones

Glucocorticoids

a) Estrogen
   - Fosfestrol

b) Progestogens
   - Megestrol
   - Medroxy progesterone

c) Gonadotropin –releasing hormone analogues
   - Goserelin
   - Cyproterone
   - Octreotide

Hormone antagonists

a) Anti-estrogens
   - Tamoxifen

b) Anti-androgens
   - Flutamide
   - Cyproterone

c) Adrenal hormone synthesis inhibitors
   - Formestane
   - Trilostane
   - Aminoglutethimide

VI. Miscellaneous

a) Crisantaspace

b) Mitotane

c) Amsacrine
d) Monoclonal antibodies
   - Rituximab
   - Trastuzumab
e) Imatinib mesylate
f) Biological response modifiers
   - Interferon Y
   - Aldesleukin
   - Tretinoin

Immune Cell and Cancer:-

The tumor microenvironment contains innate immune cells,(like macrophages, mast cells etc myeloid derived suppressor cels,dendritic cells, and natural killer cells),and Adaptive immune cells(T and B lymphocytes).These diverse cells communicate with each other by direct contact or cytokine and chemokine production and act in autocrine and paracrine manners to control and shape tumor growth. The most frequently found immune cells within the tumor microenvironment are tumor-associated macrophages (TAM) and T cells. TAMs mostly promote tumor growth and may be obligatory for angiogenesis, invasion and metastasis and high TAM contain generally correlates with poor prognosis. Mature T cells are divided into two major groups based on the T cell receptors(TCR)they express gamma, delta and alpha ,beta.alfa beta T cells are further classified according to their effectors functions as CD8+cytotoxic T cells (CTLs)and CD4+helper(Th)cells, which include Th1,Th2,Th17 and T regulatory cells, as well as natural killer T (NKT)cells. Increased T cell number s specifically activated CTLs and Th cells, correlate with better survival in some cancers, including invasive colon cancer, melanoma, multiple myeloma, and pancreatic cancer. Macrophages can classified into M1 and M2 types. Where M1 macrophages, activated by IFN gamma and microbial products. Express high levels of proinflammatory cytokines (TNF-alfa, IL-1, IL6, and IL12 orIL23), major histocompatibility complex (MHC) molecules and inducible nitric oxide synthase and are capable of killing pathogens and priming anti-tumor immune responses. By contrast ,M2 or alternatively activated macrophages, which are induced in vitro by IL4,IL10, and IL13,down regulate MHC class two and IL 12 expression and show increased expression of the anti-inflammatory cytokine IL-10,scavenger receptor A, and arginase.Most TAMs are considered to have an M2 phenotype while promoting tumor angiogenesis and tissue remodelling. However most confirmed tumor promoting cytokines are M1 cytokines, where as IL10, an M2 cytokine, may be tumor suppressive as shown in colorectal cancer.

Inflammation and Tumor Initiation:-

Tumor initiation is a process in which normal cells acquire the first mutational hit that sends them on the tumorigenic track by providing growth and survival advantages over over their neighbours. Inflammatory microenvironment can increase mutation rates in addition to enhancing the proliferation of mutated cells. Activated inflammatory cells serve as sources of reactive oxygen species (ROS) and reactive nitrogen intermediates (RNI) that are capable on inducing DNA damage and genomic instability.Alternatively, inflammatory cells may use cytokines such as TNF-alpha to stimulate ROS accumulation in neighbouring epithelial cells.

Inflammation and Tumor Promotion:-

Tumor promotion is the process of tumor growth from a single Initiated cell into a fully developed primary tumor. Initial tumor growth depends on increased cell proliferation and reduced cell death. Both of which are stimulated by inflammation driven mechanisms.

Vaccines:-

Vaccines are medicines that boost the immune system's natural ability to protect the body against foreign invaders, mainly infectious agents that may cause disease. Traditional vaccines usually contains harmless versions of microbes killed or weakened microbes or part of microbes that do not cause disease but are able to stimulate an immune response against the microbes. When the immune system encounters these substances through vaccination, it responds to them, eliminates them from the body and develops a memory of them. This vaccines induced memory enables the immune system to act quickly to protect the body if it becomes infected by the same microbes in the future.

Cancer Vaccines:-

Cancer vaccines are medicines that belong to a class of substances known as biological response response modifiers. Biological response modifiers work by stimulating or restoring the immune system's ability to fight infections and disease. There are two broad types of cancer vaccines that is Preventive (prophylactic) vaccines and Treatment (therapeutic) vaccines.

Types of Cancer Vaccines:-

Preventive (prophylactic) vaccines are intended to prevent cancer developing in healthy people. Treatment (therapeutic) Vaccines are intended to treat an existing cancer by strengthening the the body's natural defences against the cancer .Designed to stimulate the immune system –the body's natural defences to find and fight cancer cells.

Mechanism of cancer vaccines:-

Cancer cells can carry both self antigens and cancer associated antigens. The abnormal or foreign, and can cause B cells and killer T cells to mount an attack against them. Cancer cells may also make much larger amounts of certain self antigens than normal cells.beacause of their high abundance these self antigens may be viewed by the immune system as being foreign and therefore, may trigger an immune response against the cancer cells.

Mycidac (Mycobacterium w, an immunomodulator injection):-

Mycidac is a heat killed suspension of Mycobacterium W (M W), a non pathogenic, cultivable a typical mycobacterium with biochemical properties and growth characteristics resembling those belonging to Runyans group 4 class of mycobacteria.The species identity of Mycobacterium W has been defined by polymerase chain reaction (PCR) amplified DNA sequence determination and differentiated from thirty other species of mycobacteria.

Clinical Application of Mycidac:-

Mycidac has been found useful in various clinical conditions apparently unrelated to each other. However underlying immune mechanism explains its role in various diseases. The conditions wherein Mycidac is found to be useful include mycobacterial diseases like tuberculosis, leprosy, viral diseases like HIV as well as non-infectious diseases like cancer and obstructive lung diseases.

Goals of Cancer Therapy:-

Dependent on the staging of disease at the time of treatment, Localized as in early stages the goal is to eradicate the lesion by various modalities like surgery, chemotherapy, radiotherapy etc.Moderately advanced stage the goal is to decrease the tumor burden as much as possible using combinations of therapy. Advanced cases only palliative therapy is offered to improve quality of life as much as possible.

Mycidac in Oncology:-

In Early disease, use of Mycidac associated with complete remission of primary bladder cancer. This is seen in superficial as well as muscle invasive cancer. In muscle invasive cancer standard therapy is cystectomy.In moderately advanced disease, Adjunct use of Mycidac makes chemotherapy/radiotherapy tolerable, that it makes it possible to complete therapy without any interruption. And commonest side effects are gastrointestinal as well as haematological get reduced significantly with adjunct use of Mycidac. In Increased effect of chemotherapy /radiotherapy, Adjunct use of Mycidac results in improved therapeutic efficacy. The lesions which do not respond to conventional therapy shows response when Mycidac is used as an adjunct therapy. In Advanced disease, the use of Mycidac in advanced cancer is associated with marked improvement in quality of life. At the stage it is not known whether it also increases the life span.

Mycidac Dosage:-

- It is generally administered intradermally.
- It is advisable to inject 0.1ml of the drug per site.
- The amount of the drug to be administered at one time and its frequency of administration are described to be dependent on therapeutic condition

At initial dose:-

- In all indications, usually 0.2 ml of Mycidac is given initially in two divided dose of 0.1ml on each subsequently.

At subsequent dose:-

- The amount of Mycidac and frequency of administration described varies widely in cancer depending on type of cancer and stage of disease. For palliative therapy dose as high as 0.3ml twice a week has been administrated with good results.

Administration of Mycidac:-

- The recommended site for giving the Mycidac is at the insertion of the deltoid muscle near the middle of the left arm.
- Sites higher on the arm are more likely to lead to keloid formation, the tip of the shoulder particularly.
- For cosmetic reasons, a scar on the upper and lateral surface of the thigh may be preferred and this is an alternative site.
- Mycidac must be given strictly intradermally with a fresh needle and syringe for each subject.
- Mycidac should be drawn into a tuberculin syringe and 3/8”25G (0.5*10mm)or 26G (0.45*10mm)short bevelled needle attached to give the injection.
- The needle must be attached firmly with the bevel uppermost.
- The upper arm must be approximately 45 degrees to the body.
- The skin is cleaned with spirit and allowed to dry.
- The operator stretches the skin between the thumb and forefinger of one hand and with the other slowly inserts the needle, with the bevel upwards, for about 2mm into the superficial layers of the dermis almost parallel with the surface.
- A correctly given intradermal injection results in a tense blanched raised bleb and considerable resistance is felt when the fluid is being injected.

Immunization reaction and care:-

Following intradermal administration of Mycidac, normally a local reaction develops at the develops at the immunization site within two to six weeks, beginning as a small papule which increase in size for a few weeks widening into a circular area with scaling ,crusting and occasional bruising. Occasionally a shallow ulcer develops. It is not necessary to protect the site from becoming wet during washing and bathing, but should any oozing occur, a temporary dry dressing may be used until a scab forms. It is essential that air be not excluded. If absolutely essential an impervious dressing may be applied but only for a short period (like to permit swimming), as it may delay healing and cause a larger scar. The lesion slowly subsides over several months and eventually heals leaving only a small, flat scar.

Adverse reactions:-

Severe injection site reactions, large ulcers and abscesses are most commonly caused by faulty injection technique where part or the entire dose is administered too deeply (subcutaneous instead of intradermally).Keloid formation at the injection site is an uncommon and largely avoidable, complication of Mycidac. Some sites are more prone to keloid formation than others and those using Mycidac should adhere to the two sites recommended.(The mid-upper arm or the high).Most experience has been gained in the use of the upper arm and it is known that the risk of keloid formation is increased manifold when

the injection is given at a site higher than the insertion of the deltoid muscle near the middle of the upper arm.

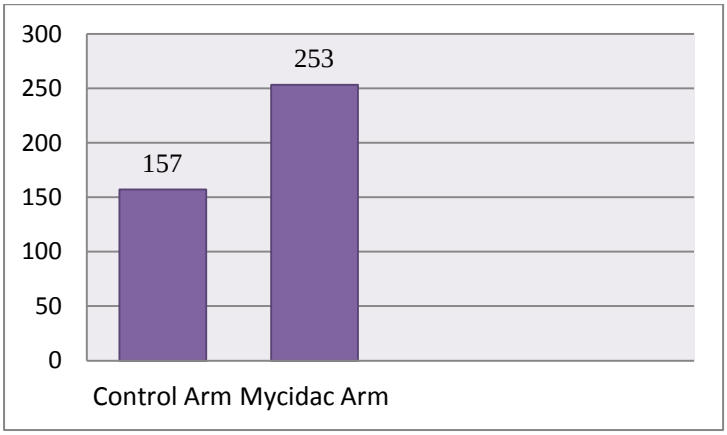
Contraindications:-

- Mycidac should not be given to individuals with fever.
- Individuals with generalized septic skin condition (if eczema exists, a site should be chosen that is free from skin lesions).

Clinical Study (Mycidac in NSCLC):-

- A phase 2 randomized study was conducted to test the efficacy of the combination of paclitaxel plus cisplatin with or without Mycidac as first line treatment of advanced NSCLC.
- Two hundred and twenty one patients with stage 3B and 4, NSCLC were randomized to receive paclitaxel 175mg/m2 intravenous, 3 hour infusion and cisplatin 100mg/m2 intravenous with or without Mycidac administered intradermally.
- Mycidac was administered intradermally, 0.1 ml on each deltoid on the first visit at least 1week prior to 1st cycle and then on day 8 and 15 of each of cycle of chemotherapy.
- The cycles were repeated every 3 weeks for a total of 4 cycles.
- Mycidac was administrated once a month thereafter until progression or for a maximum of 12 months from the start of treatment in the investigational arm.

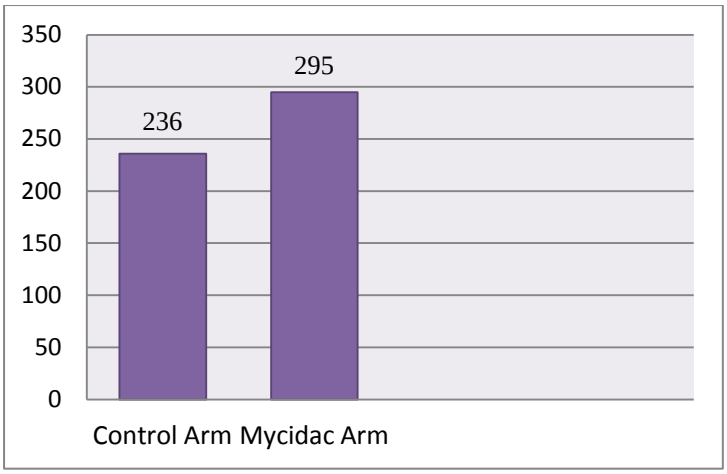
Median PFS (Median Progression Free Survival):-



(Fig 1:-Median Progression Free Survival)

Median progression free survival was 157 days in control arm and 253 days in the Mycidac arm.

Median Overall Survival:-



(Fig 2:- Median Overall Survival)

Median overall Survival was 236 days in control arm and 295 days in the Mycidac arm.

- Addition of Mycidac to paclitaxel plus cisplatin in patients with advanced NSCLC is safe and results in both improvement in progression free survival and overall survival.

Chronic Kidney Disease:

Chronic diseases have become a major cause of global morbidy and mortality even in developing countries. The burden of chronic kidney disease (CKD) in India cannot be aaessed accurately. The approximate prevalence of CKD is 800 per million population and the incidence of end stage renal disease (ESRD) is 150-200 pmp.The most common cause of CKD in population based studies is diabetic nephropathy.

Anaemia has long been recognised as one of the most common problems causing morbidity in pre-dialysis patients and patients of chronic kidney disease(CKD)While they are on dialysis .The need for a renewable source of erythropoietin to treat the anaemia of CKD was first recognised in the 160s,but cloning and expression of human gene was not achieved until 1983.Cinical testing of recombinant human erythropoietin began in 1985,leading to the first licence as a therapeutic agent in 1988.The reduction of functioning renal tissue in CKD decreases the kidney's ability to respond to reduced oxygen delivery and to produce erythropoietin, a hormone that promotes red blood cell(RBC) production in the bone marrow. In general, a correlation exists between the extent of renal insufficiency and the severity of the anaemia. The anaemia appears to result primarily from a decrease in EPO production. Other factor that have been implicated are short RBC survival time, iron and folate deficiencies, and inhibition of haematopoiesis by toxic metabolites or inhibitos.Erythropoietin is a major advance in the field of anaemia in CKD.It stimulates erythropoiesis by increasing proliferation and maturation of erythropoiesis by increasing proliferation and maturation of erythroid progenitors. Use of erythropoietin in anemia of CKD has been reported to reduce the risk of cardiovascular disease ,improve patient well

being, exercise tolerance, and reduce the need for blood transfusion which also contributes to the decrease in transmission of hepatitis virus infection .Recombinant human erythropoietin is the single most important advances in the management of ESRD (End Stage Renal Disease)in the last 20 years. Different experimental data support the hypothesis that correction of anaemia with erythropoietin may slow the rate of progression of kidney disease .Usefulness of the erythropoietin therefore led to the discovery o recombinant human EPO using genetic engineering technology, the aim being to produce an effective drug with least antigenicity.The progress in molecular biology has revealed the whole amino acid sequence of human EPO from the structure gene and it has made it possible to produce human EPO in large quantities using genetic engineering technology.Recombinant human erythropoietin a highly purified drug manufactured through dye-affinity chromatography ,ion-exchange chromatography and gel-filtration from recombinant CHO cells was used in this study. It has identical amino acid sequence and analogous carbohydrate structures to naturally occurring erythropoietin.

Erythropoietin:-

Erythropoietin is a glycoprotein hormone that controls erythropoiesis, or red blood cell production. It is a cytokine for erythrocyte (red blood cell) production. It is a cytokine for erythrocyte (red blood cell) precursors in the bone marrow. It is produced by the peritubular capillary endothelial cells in the kidney and liver. It is used in treating anaemia resulting from chronic kidney disease, from the treatment of cancer (chemotherapy and radiation),and from other critical illnesses(heart failure).Since 1989 recombinant human erythropoietin has been used as a drug for the correction of anemia. Recombinant human erythropoietin differs from its natural counterpart in the glycidic part of the molecule. Different forms of recombinant human erythropoietin(rHuEPO),Acts by stimulating the proliferation,survival,and differentiation of erythroid progenitors into reticulocytes.Approved for either intravenous(iv) or subcutaneous (sc) administration 2 to 3 times per week (often given less frequently in clinical practice).Frequency of administration dictated partly by short biologic half life(~6-8hours following a single intravenous injection).

Different forms of Erythropoietin:-

Epoetin alpha and beta have same amino acid sequence but differ in glycosylation. Darbepoetin alpha differs in amino acid sequence and degree of glycosylation (This extends the half life by at least three folds and allows for decreased frequency of administration).All exert principal clinical effect by binding to the EPO receptor. All have similar pharmacodynamic effects when used at recommended dosages. Similar toxicity profile across products.

Erythropoietin Alfa:-

Epoetin alpha a 165 amino acid glycoprotein manufactured by recombinant DNA technology, has the same biological effects as endogenous erythropoietin. It has a molecular weight of 30400 Daltons and is produced by mammalian cell into which the human erythropoietin gene has been introduced. The product contains the identical amino acid sequence of isolated natural erythropoietin.

Indications:-

Treatment of anemia of chronic renal failure patients (anemia associated with CRF, including patients on dialysis and patients not on dialysis).Treatment of anemia in cancer patients on chemotherapy. Reduction of Allergenic blood transfusion in surgery patients. Treatment of anemia in Zidovudine-treated HIV-infected patients.

Mechanism of Action:-

Endogenous production of erythropoietin is normally regulated by level of tissue oxygenation. Hypoxia and anemia generally increase the production of erythropoietin, which in turn stimulates erythropoiesis.Epoetin alpha has been shown to stimulate erythropoiesis in anemic patients.

Dosage:-

- Chronic Renal Failure Patients:-
  Starting Dose:
  - Adults: 50 to 100 units/kg TIW; IV or SC
  - Paediatric patients:50 units/kg TIW; IV or SC
  - Increase dose by 25% if:
    - ✓ Haemoglobin is <10gm/dl and has not increased by 1gm/dl after 4 weeks of therapy or
    - ✓ Haemoglobin decreases below 10gm/dl
  - Reduced dose by 25%when:
    - ✓ Haemoglobin approaches 12 gm/dl or
    - ✓ Haemoglobin increases.1gm/dl in any 2 week period.

Maintenance dose:-

- The maintenance dose ,must be individualized for each patient on dialysis in the us phase 3 multicenter trial in patients on haemodialysis ,the median maintenance dose was 75 units/kg TIW,with a range from 12.5 to 525 units/kg TIW.

Dosage:-

- Cancer patients on chemotherapy**:-**
  - The initial recommended dose of EPO in adults is 150 units/kg SC, TIW or 40000 units SC weekly.
  - The initial recommended dose of EPO in paediatric patients is 600 units/kg IV weekly.

Adverse Reactions:-

- Immunogenicity
- Hypertension
- Seizures

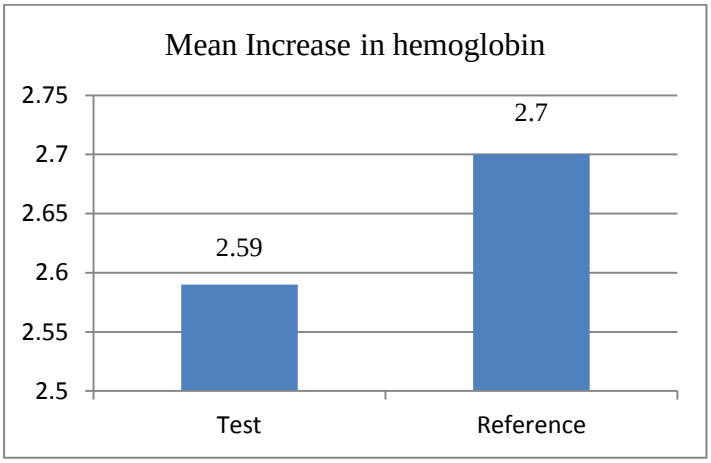
- Thrombotic events: clotting of the vascular access (A-V shunt), myocardial infarction, cerebral vascular accidents, transient ischemic attack & pulmonary embolism.
- Allergic reactions.

Cadicrit USP:-

- Indigenous erythropoietin from India.
- Manufactured at cadilla's world class manufacturing facility.
- Characterization done as per European pharmacopoeia standards.
- Proven clinical experience in anemia management in CRF.
- Multi-centric, phase 3 clinical trial to establish efficacy and safety.
- Mean increase in the haemoglobin 2.59gm/dl.

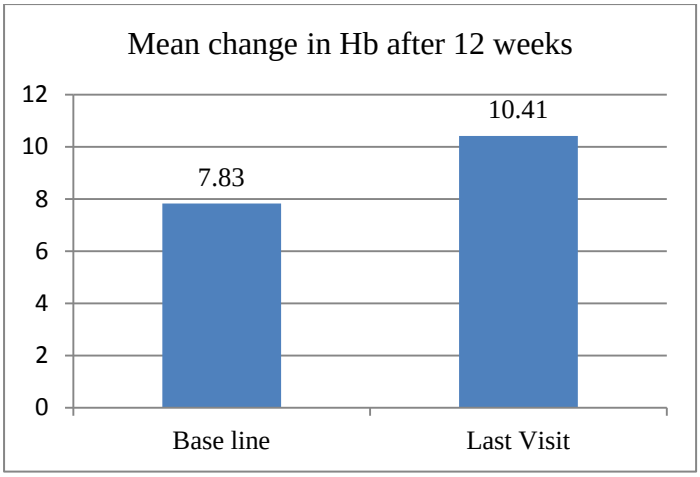
Phase 3 Clinical Trial:-

- Study Title:
  - ✓ To assess efficacy & safety of CADICRIT, recombinant human erythropoietin, in patients with Anemia of chronic renal failure (CRF).
- Trial Design:
  - ✓ Open-level, single arm, multi-centric, phase 3 clinical trial of 12 weeks duration. The enrolled patients received CADICRIT at a dose level of 100 IU/kg/week divided over two doses for 12 weeks. Frequency of dosing was twice a week.
- Results:
  - ✓ Total 101 patients enrolled in the trial. In total 89 patients completed trial.
  - ✓ 93.26 %(83 of 89) patients showed response to CADICRIT.



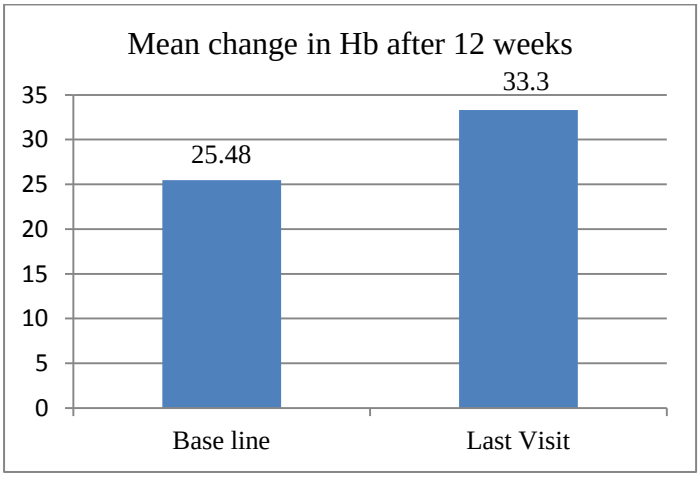
(Fig 3 :- Mean Increase in Haemoglobin)

CADICRIT 2.59 gm/dl Vs Reference 2.7 gm/dl



(Fig 4:- Mean change in Hb after 12 weeks)

7.83 gm/dl Vs 10.41 gm/dl.



(Fig 5:- Mean change in Hb after 12 weeks)

25.48 gm/dl Vs 33.30 gm/dl.

- Safety Analysis:-
  During trial period, in all 21 adverse events (AEs) were reported in 17 patients. Some patients showed more than one AE.all AEs were resolved without any residual complications. None of the AEs had a possible relation to CADICRIT.
- Conclusion:-
  CADICRIT was found to be effective in increasing Haemoglobin and Hematocrit levels in patients of chronic kidney disease (stage 3 to stage 4) with anemia.

Competitors:-

BRAND NAME	COMPOSITION	COMPANY	PACKING	MRP Rs.
CERITON inj	Erythropoietin 3000 iu	RANBAXY	vial	1200.00
CERITON inj	Erythropoietin 2000 iu	RANBAXY	vial	750.00
CERITON inj	Erythropoietin 10000 iu	RANBAXY	vial	2750.00
CERITON inj	Erythropoietin 4000 iu	RANBAXY	vial	1400.00
EPOFER inj	Erythropoietin 6000 iu	EMCURE	vial	1390.00
EPOFER inj	Erythropoietin 3000 iu	EMCURE	vial	890.00
EPOFER inj	Erythropoietin 2000 iu	EMCURE	vial	590.00
EPOFER inj	Erythropoietin 4000 iu	EMCURE	vial	1190.00
EPOFIT-2000 inj	Erythropoietin 2000 iu	INTAS	vial	N.A.
EPOFIT-4000 inj	Erythropoietin 4000 iu	INTAS	vial	N.A.
EPOSIS inj	Erythropoietin 10000 iu	MICRO LABS	vial	3200.00
EPOSIS inj	Erythropoietin 4000 iu	MICRO LABS	vial	1550.00
EPOSIS inj	Erythropoietin 2000 iu	MICRO LABS	vial	800.00
EPOTOP prefilled syringe	Erythropoietin 6000 iu	VHB	0.6ml prefilled syringe	2140.00
EPOX inj	Erythropoietin 4000 iu	WOCKHARDT	1 ml vial	1550.00
EPOX inj	Erythropoietin 2000 iu	WOCKHARDT	0.5 ml vial	798.00
EPREX inj	Erythropoietin 10000 iu	ETHNOR	vial	4750.00
EPREX inj	Erythropoietin 4000 iu	ETHNOR	vial	2010.00
EPREX inj	Erythropoietin 3000 iu	ETHNOR	vial	1530.00
EPREX inj	Erythropoietin 2000 iu	ETHNOR	vial	1020.00
EPREX inj	Erythropoietin 1000 iu	ETHNOR	vial	510.00
ERYPRO PF syringe	Erythropoietin 10000 iu	BIOCON	1ml	2900.00
ERYPRO PF syringe	Erythropoietin 5000 iu	BIOCON	1ml	1700.00
ERYPRO PF syringe	Erythropoietin 4000 iu	BIOCON	1ml	1300.00
ERYPRO PF syringe	Erythropoietin 3000 iu	BIOCON	1ml	960.00
ERYPRO PF syringe	Erythropoietin 2000 iu	BIOCON	1ml	700.00
HEMAX inj	Erythropoietin 4000 iu	HAL	1ml	1750.00
HEMAX inj	Erythropoietin 2000 iu	HAL	1ml	882.00
SHANPOETIN PF syringe	Erythropoietin 4000 iu	SHANTHA BIOTEC	1ml	1550.00
SHANPOETIN PF syringe	Erythropoietin 1000 iu	SHANTHA BIOTEC	0.5ml	800.00
ZYROP inj	Erythropoietin 2000 iu	ZYDUS BIOGEN	2ml	998.91
ZYROP inj	Erythropoietin 4000 iu	ZYDUS BIOGEN	2ml	1275.00

(Table 1:- Competitors of Cadicrit)

RESEARCH METHODS

Methods:-

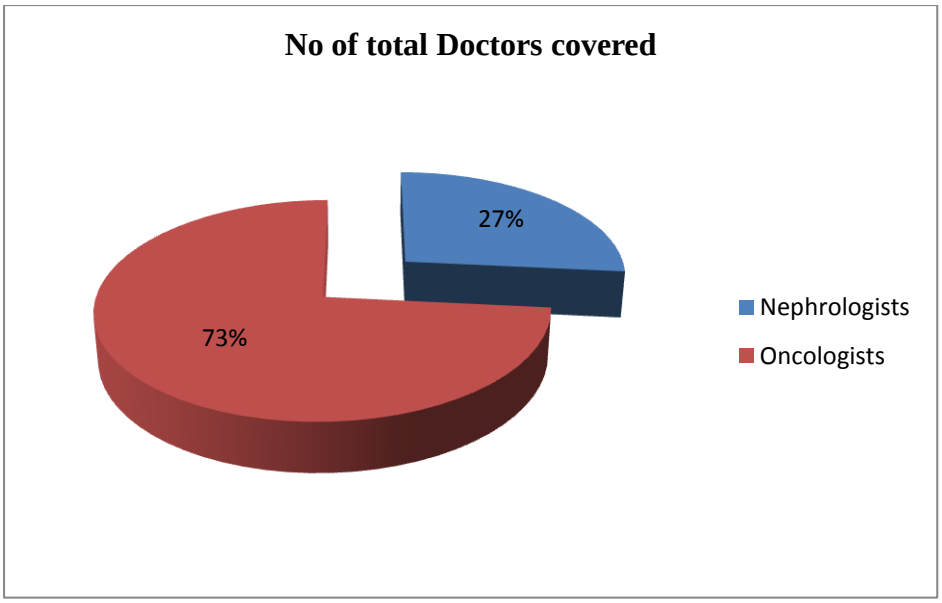
A questionnaire survey was conducted of Oncologists and Nephrologists, asking their treatment preferences, the prescribing patterns, line of treatment, and awareness of Nephrologists and Oncologists for respective products .This study was also conducted to aware the Nephrologists and Oncologists regarding newly launched drug Mycidac and Cadicrit from the Oncocare division of Cadila Pharmaceutical Limited. This gives a brief idea about the line of treatment of Oncologists and Nephrologists, and their treatment preferences, awareness of drug. For Non Small cell Lung Cancer and Chronic Kidney Disease or Chronic Renal Failure. Prior to collecting data, the questions were reviewed by the GM of sales and marketing of Oncology Department of Cadila Pharmaceutical Limited and approved for use. The questionnaire is both open-ended and closed-ended. The questionnaire was distributed in a manner that mainly covered the Jaipur and Ahmedabad. Doctors were asked about their first choice of treatment plus their line of treatment and awareness of the product any others they would discuss with the patients regarding safety and efficacy and side effect, any precaution while prescribing the drug. In all, 49 doctors were identified, in which 13 were Nephrologists and 36 were Oncologists in the Jaipur and Ahmedabad.

- Types of Research:-
  - ✓ Descriptive research.
- Data collection method:- Both Primary and Secondary data were collected.
  - ✓ Primary Data:- The primary data was collected through means of a structured questionnaire, targeted towards Oncologists and Nephrologists. A structured questionnaire was designed covering both close ended and open ended questions. It was aimed to derive maximum information from the both Oncologists and Nephrologists.
  - ✓ Secondary data:-It is the one that is already available. It was required to study the different classes of chemotherapeutic agents, Immunomodulators, study of the company profile. and study of different Oncocare products of Cadila and its comptitors.Hence it was greatly helpful in drafting this report.
- Sampling method:-
  - ✓ Judgmental sampling
- Research tool:
  - ✓ Questionnaire containing both open-ended as well as close ended questions.
- Sampling plan:-
  - ✓ The target population under the study were Oncologists and Nephrologists. In Jaipur, and Ahmedabad.
- Sample size :- 49
- The details of sample size:-
  - ✓ Nephrologists-: 13
  - ✓ Oncologist -: 36
- Data analysis techniques:-
  - ✓ Statistical analysis like graphs, charts, etc was done using statistical package like Microsoft excel. The observational findings and the information collected were compiled, analyzed on excel sheet and a report was prepared.

DATA ANALYSIS

Data Analysis:-

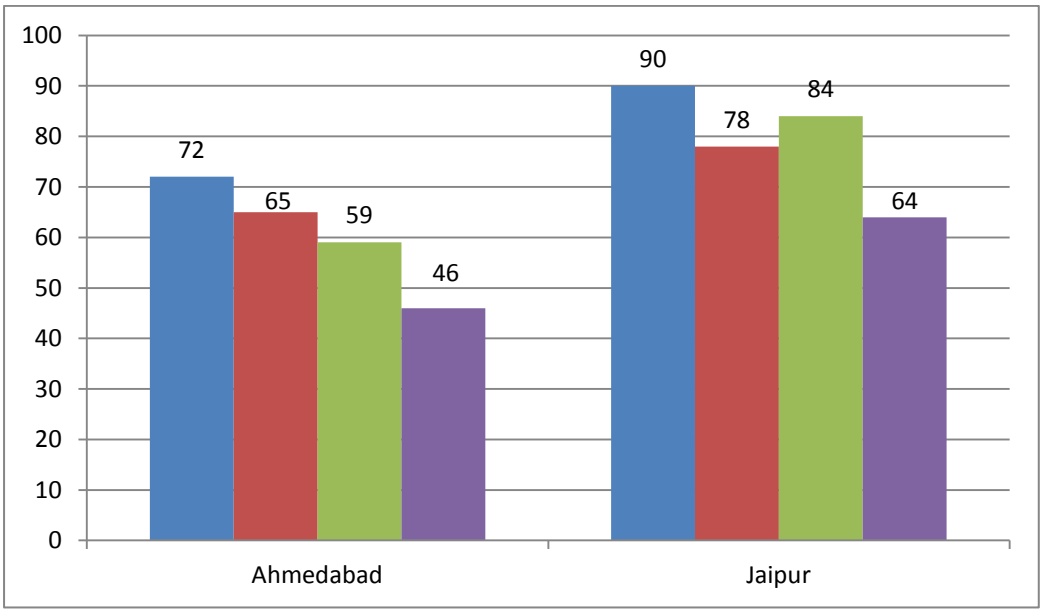
Total Sample Size: - 49 Doctors.



(Fig 6:- No of Doctors covered in Ahmedabad & Jaipur)

This graph shows the no of Doctors drawn as a sample.

No of Patients coming to Oncologists for treatment per week in a month



(Fig 7:- No of Patients coming to Oncologists for treatment per week in a month)

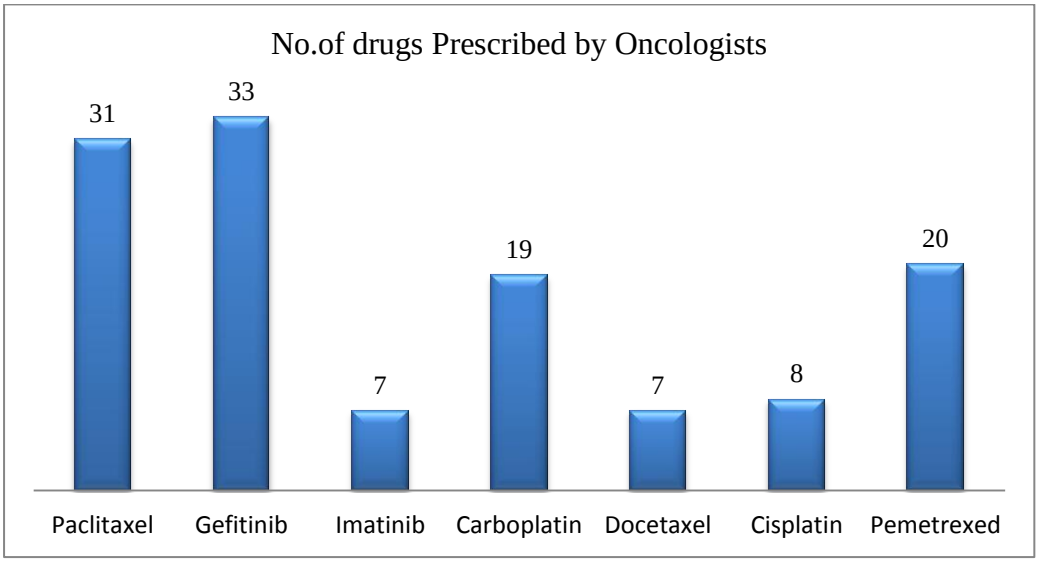
Interpretation:-

This graph shows Average no. patients coming to doctor for treatment. On the contrary Jaipur having highest no of patients in comparison to Ahmedabad.

Number of Oncologists preferring Drugs:-

Sl.No	Preferred Drug	No. of Oncologists Who Preferred
1	Paclitaxel	31
2	Gefitinib	33
3	Imatinib	7
4	Carboplatin	19
5	Docetaxel	7
6	Cisplatin	8
7	Pemetrexed	20

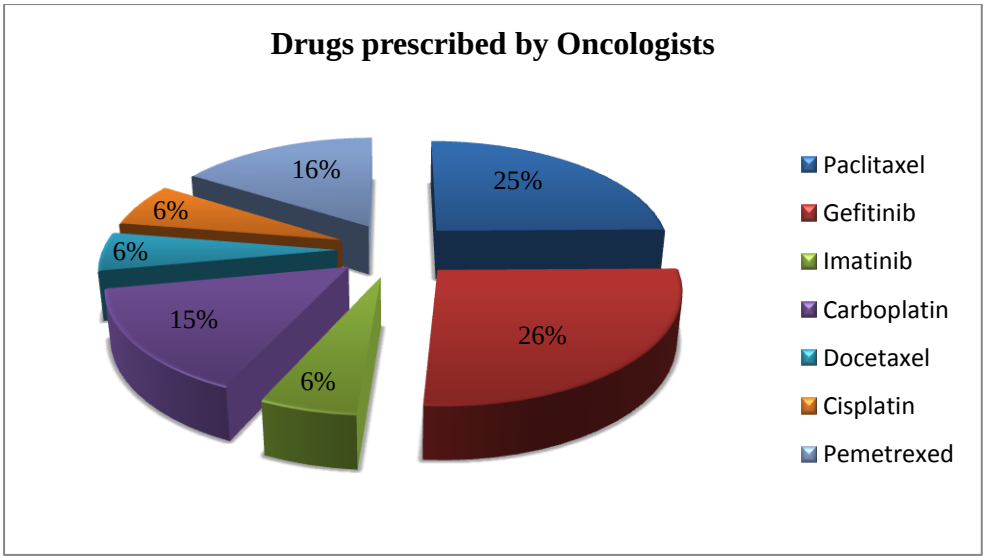
(Table 2:- No of Oncologists preferring Drugs)



(Fig 8:- No of Drugs prescribed by Oncologists)

Interpretation:-

This graph shows the preferred drug for treatment by Oncologists. In which almost all Oncologists prefer Gefitinib and Paclitaxel during prescribing. Almost all Oncologists prefer more than one drug, but Gefitinib and Paclitaxel are more effective and safe.

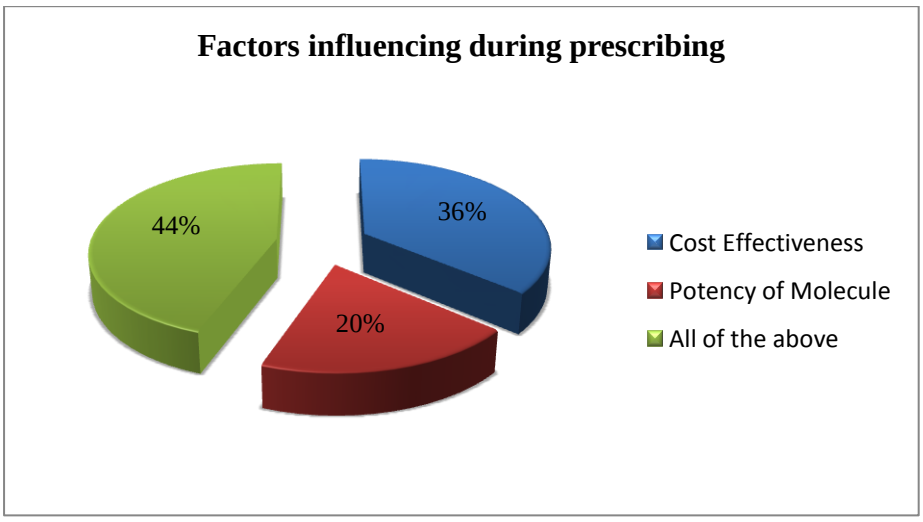


(Fig 9:- Drugs prescribed by Oncologists)

Interpretation:-

Preferred drugs prescribed by Oncologists are shown in percentage. Which shows Gefitinib and Paclitaxel is the 1st in terms of prescribing to patients due to its safety and efficacy than the drug.

Factors Influencing During Treatment of Cancer:

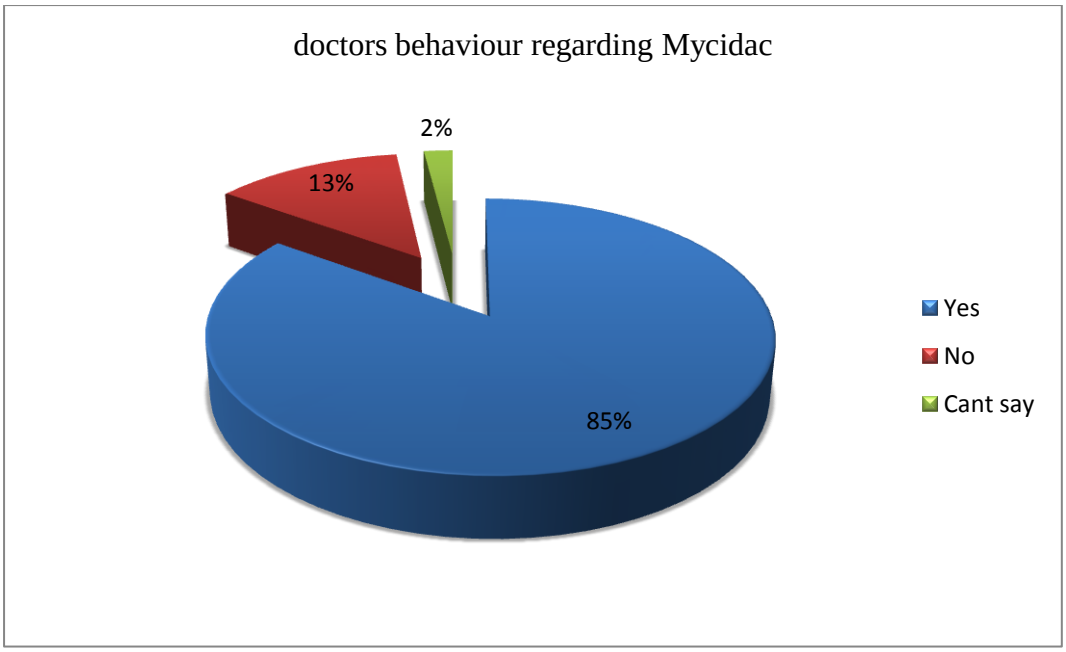


(Fig 10:- Factors influencing during prescribing)

Interpretation:-

This data shows the factors which influences the Oncologists during prescribing the drug. In which maximum doctors influenced by both cost effectiveness and potency of molecule. Almost 20% doctors influenced by potency of molecule, and 36% doctors influenced by cost effectiveness, and rest 44% doctors influenced by both cost effectiveness and potency of molecule.

Doctors behaviour regarding Mycidac:-

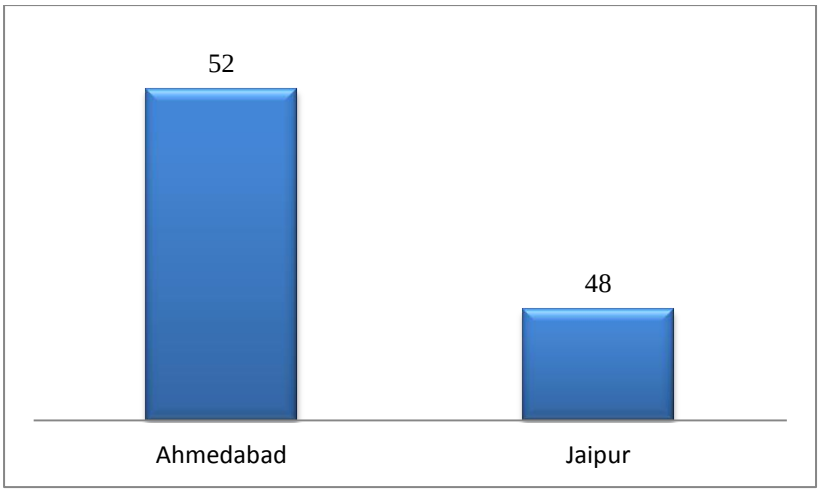


(Fig 11 :- Doctors behaviour regarding MYCIDAC)

Interpretation:-

This data shows during survey after showing the clinical data of Mycidac, by observing the overall survival rate & progression survival rate almost 85% oncologists are willing to prescribe Mycidac to their patients. About 13% oncologists are refused to prescribe Mycidac due to brand loyalty. About 2% oncologists refused to answer.

No of Patients coming to Nephrologists for treatment per week in a month:-

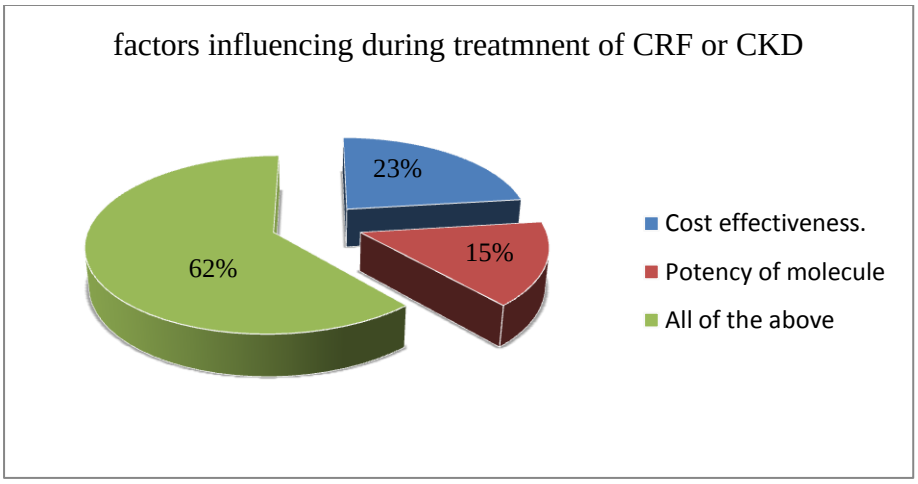


(Fig 12:- No of patients coming to Nephrologists for treatment per week in a month)

Interpretation:

This is the average no of patients coming for treatment per week in a month. In which maximum patients suffering from CRF or CKD are present in Ahmedabad than Jaipur, and they regularly visit to Doctor.

Factors Influencing During Treatment of CRF OR CKD

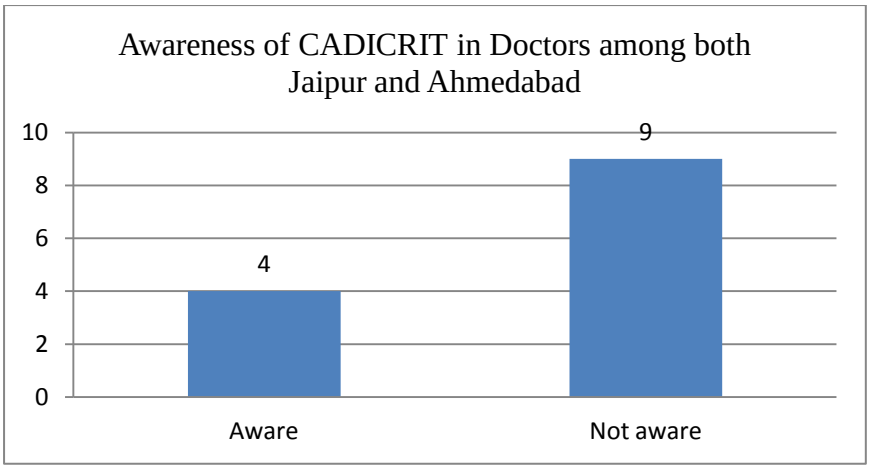


(Fig 13:- Factors influencing during treatment of CRF or CKD)

Interpretation:-

This data shows the factors which influences the Nephrologists during prescribing the drug. In which maximum doctors influenced by both cost effectiveness and potency of molecule. Almost 15% doctors influenced by potency of molecule, and 23% doctors influenced by cost effectiveness, and rest 62% doctors influenced by both cost effectiveness and potency of molecule.

Awareness of CADICRIT in Doctors among both Jaipur and Ahmedabad:-

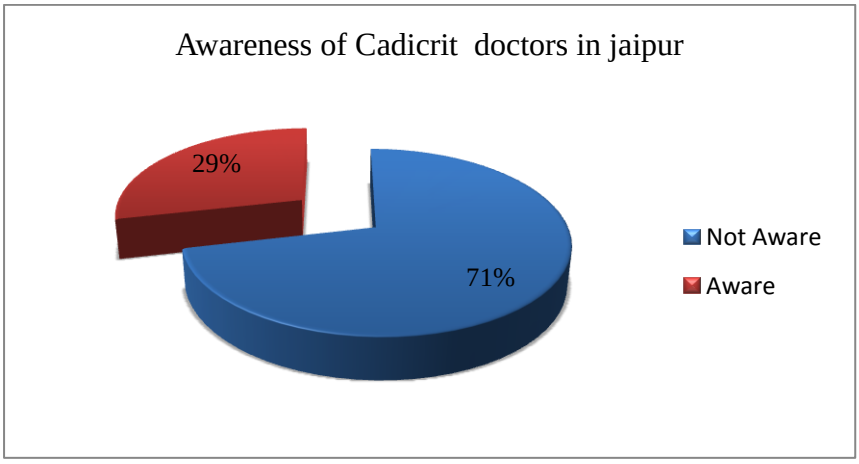


(Fig 14:- Awareness of Cadicrit in Doctors in both jaipur and Ahmedabad)

Interpretation:-

This graph shows data of Nephrologists of both Ahmedabad and Jaipur.In both place maximum no of Doctors are not aware of this drug CADICRIT.In Ahmedabad out of 6 Nephrologists 4 are not aware of CADICRIT, and rest 2 are aware of CADICRIT.In Jaipur out of 7 Nephrologists 2 are aware and 5 Nephrologists are not aware.so in total 9 doctors are not aware of CADICRIT,and 4 Doctors are aware of the drug CADICRIT.

Awareness of CADICRIT among Doctors in Jaipur:-



This data shows no of awareness in doctors regarding CADICRIT In both Jaipur and

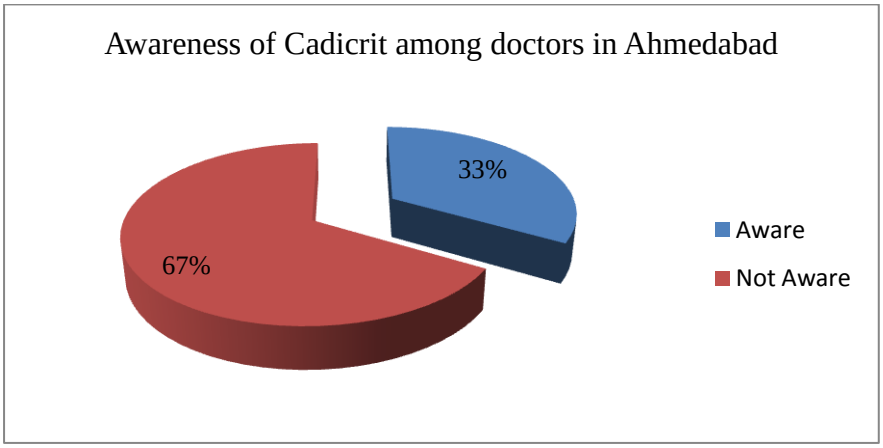
(Fig 15:- Awareness of Cadicrit in Doctors in jaipur)

Interpretation;-

Ahmedabad. Where maximum Doctors are not aware regarding the product CADICRIT.Almost 71% doctors are not aware regarding the product CADICRIT in both

Ahmedabad and Jaipur city. Almost 29% Doctors are aware of CADICRIT in both Jaipur and Ahmedabad city.

Awareness of CADICRIT among Doctors in Ahmedabad:-

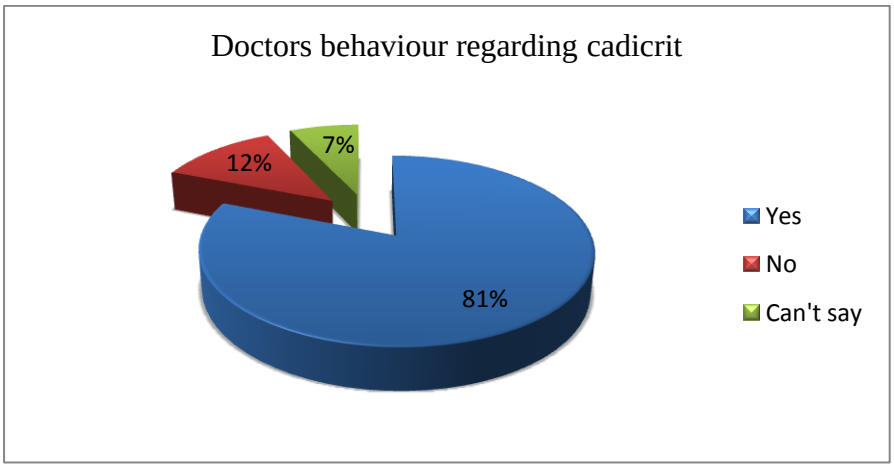


(Fig 16:- Awareness of Cadicrit in Doctors in Ahmedabad)

Interpretation:-

This data shows no of awareness in doctors regarding CADICRIT In Ahmedabad.Where maximum Doctors are not aware regarding the product CADICRIT.Almost 67% doctors are not aware regarding the product CADICRIT,and Almost 33% Doctors are aware of CADICRIT in Ahmedabad.

Doctors behaviour regarding Cadicrit:-



(Fig 17:- Doctors behaviour regarding CADICRIT)

Interpretation:-

This data shows during survey after showing the clinical data of Cadicrit, by observing the phase 3 clinical data almost 81% nephrologists are willing to prescribe Cadicrit to their patients. About 12% nephrologists are refused to prescribe Cadicrit due to brand loyalty. About 7% oncologists refused to answer.

CONCLUSION & RECOMMENDATION

Discussion:-

In this study, a survey of oncologists Nephrologists shows that there is little consensus about which treatments should be used. All the Oncologists and Nephrologists have completed the questionnaires. The response rate of my study was 100%.this survey was conducted in two cities were Jaipur and Ahmedabad. The study concluded that the treatment preferences of Oncologists and Nephrologists are not surprising, but it used only to benefit patients. Where maximum Oncologists prefer Gefitinib and Paclitaxel most due to its less side effect, and more effective. Maximum Nephrologist's line of treatment is same, they prescribing both Erythropoietin and iron to their patient. Some factors are there which are influencing both oncologists and Nephrologists during prescribing the medicine like cost effectiveness and potency of molecule.

Conclusions

- This survey demonstrated that the oncologists should prescribe the medicine according to both potency and safety of molecule. As Mycidac improves median progression free survival by 96 days and improves median overall survival by 59 days, and improves tolerance to chemotherapy and radiotherapy so that maximum doctors almost 85 % are willing to pass benefits of Mycidac to their patient. As it is an immunomodulator containing mycobacterium w so it will be more effective than any chemotherapy in treatment of Non small cell lung cancer.
- This survey was also demonstrated the nephrologists and their line of treatment are same & they prescribe both erythropoietin and iron. Maximum Nephrologists are not aware of the drug CADICRIT. After showing the phase 3 clinical trial data of cadicrit almost 81% doctors are willing to pass benefits of Cadicrit to their patient.

Recommendations:-

As it is concluded that maximum no of Nephrologists are little aware of drug that is CADICRIT, it is suggested that noise level at all nephrologists should be increased which will eventually lead CADICRIT to increase its market share.

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ANNEXURE

Questionnaire for Cadicrit

Name of Doctor: Address:

Contact no:

1) What is your line of treatment?

2) Which drug you prescribe during the treatment of CRF?

3) Which factor influence you during CRF or CKD treatment??
    a. Cost effectiveness.
    b. Potency of molecule.
    c. All of the above.

4) How common is anemia in patient suffering from CRF or CKD?

5) How frequent you prescribe erythropoietin in patients suffering from CRF or CKD?

6) Doctor are you aware of our brand Cadicrit that is erythropoietin?

Questionnaire for Mycidac

Name of Doctor: Address:

Contact no:

1) Which drug you prescribe during the treatment of lung cancer?

2) Which factor influence you during prescribing the medicine?
    a. Cost effectiveness.
    b. Potency of molecule.
    c. All of the above

3) Have you ever used immunomodulator therapy? In which indication?

    a. Yes
    b. No

4) If yes then which indication you mostly prescribed?

5) Which molecule you preferred? Of which brand?

6) While selecting a therapy do you consider any specific benefit to patient?

7) Are you aware of mycobacterium w?

8) Doctor as You will agree that mycobacterium w benefits your patient in terms of improved overall survival rate by 59 days and progression free survival by 96 days as well as there is improvement in response rate by 31.5%.

9) Doctor will you pass the benefits of Mycidac to your patient?
    a. Yes
    b. No

LIST OF TABLES & FIGURES

Tables:-