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MARKETING SURVEY OF ANTI CANCER DRUG

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ABSTRACT

In the past 20 years, a large number of oral anti-cancer medications have entered the market. For instance, kinase inhibitors, such BCR-ABL and BRAF inhibitors, have significantly improved the therapy of melanoma and chronic myeloid leukaemia. A traditional way of treating cancer known as anti-angiogenic therapy tries to stop the supply of nutrients and oxygen to the tumour cells by reducing the vascular network and preventing the growth of new blood vessels.

This may be the case since only a small portion of the modest increase for patients is attributable to newly discovered and recently marketed medications. Improvements could be suggested through a performance evaluation of the regulatory authorities.

Drugs must be released quickly for patients who require them, but not at the price of proper information on the drugs' true benefits. Chemotherapy, Lenalidomide, Bendamustine, Plicamycin, Hexalen, elispar are medication that provide long term medication.

KEYWORDS: CANCER, TUMOR, HEXALEN, CHEMOTHERAPY, BENDAMUSTINE, LEUKOMENIA.

INTRODUCTION

Cancer is a condition when a few of the body's cells grow out of control and spread to other bodily regions. In the millions of cells that make up the human body, cancer can develop practically anywhere. Human cells often divide (via a process known as cell growth and multiplication) to create new cells as the body requires them. New cells replace old ones when they die as a result of ageing or damage.

Occasionally, this systematic process fails, causing damaged or aberrant cells to proliferate when they shouldn't. Tumors, which are tissue masses, can develop from these cells. Tumors may or may not be malignant (benign).

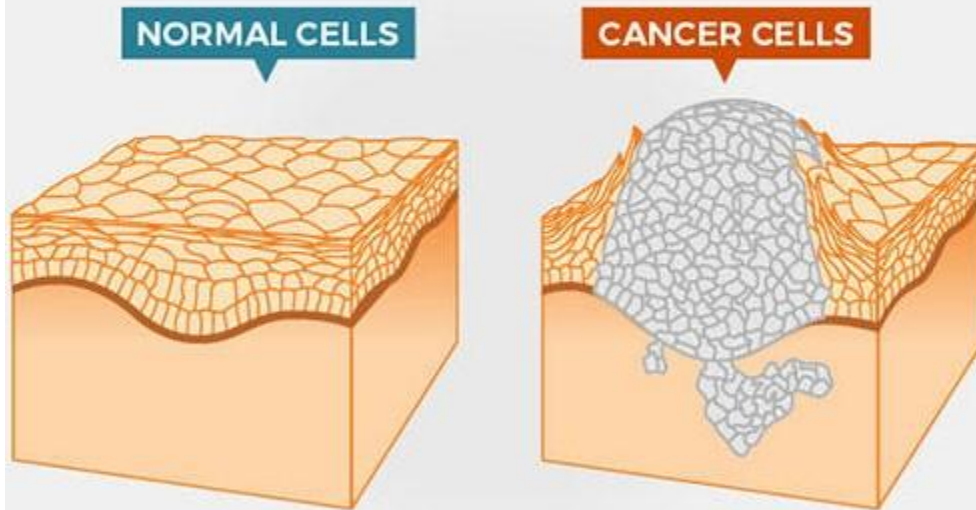
Cancerous tumours can move to distant parts of the body to produce new tumours, invade neighbouring tissues, or both (a process called metastasis). Malignant tumours are another name for cancerous tumours. Malignancies of the blood, including leukemias, seldom develop solid tumours although many other cancers do. Noncancerous tumours do not penetrate or spread to neighbouring tissues. Benign tumours typically don't come back after removal, however malignant tumours can. However, benign tumours can occasionally grow to be quite enormous. Some, like benign brain tumours, can have grave side effects or even be fatal.

About 22% of cancer fatalities are related to tobacco usage. Another 10% of cases are brought on by obesity, a bad diet, a lack of exercise, or excessive alcohol consumption. Other concerns include exposure to ionising radiation, certain diseases, and environmental contaminants. Infections including *Helicobacter pylori*, hepatitis B, hepatitis C, human papillomavirus infection, Epstein-Barr virus, and human immunodeficiency virus account for 15% of cancer cases in underdeveloped countries (HIV). These elements influence a cell's genes, at least in part. Before cancer manifests, numerous genetic alterations are typically necessary. 5–10% of malignancies are brought on by inherited genetic flaws. A few warning signs and symptoms as well as screening tests can help diagnose cancer. Medical imaging is often used to do additional research, followed by biopsy for confirmation.

Around 90.5 million people worldwide had cancer in 2015. Globally, there were 10 million cancer-related fatalities in 2019 and 23.6 million new instances of the disease per year, suggesting rises of 26% and 21% over the previous ten years, respectively.

Lung, prostate, colorectal, and stomach cancer are the most prevalent forms of cancer in men. Breast cancer, colorectal cancer, lung cancer, and cervical cancer are the most prevalent forms in females. In terms of the total number of new instances of cancer each year, skin cancers other than melanoma would make up about 40% of the cases. Except in Africa, where non-Hodgkin lymphoma is more prevalent, acute lymphoblastic leukaemia and brain tumours are the most common cancers in children. In 2012, there were around 165,000 children under the age were given a cancer diagnosis. Age considerably raises the risk of cancer, and several malignancies are more prevalent in industrialised nations. As more individuals live to old age and as lifestyle changes take place in the developing countries, rates are rising. As of 2010, it was projected that the annual economic expenses of cancer worldwide was US\$1.16 trillion.

How Does Cancer Form?



TYPES OF CANCER

Additionally, a number of clinical terms are employed for certain cancer types in general:

- A cancer called a carcinoma usually begins in the skin or the tissues that surround other organs.

Sarcoma is a type of cancer that affects connective tissues like blood vessels, muscles, cartilage, and bones.

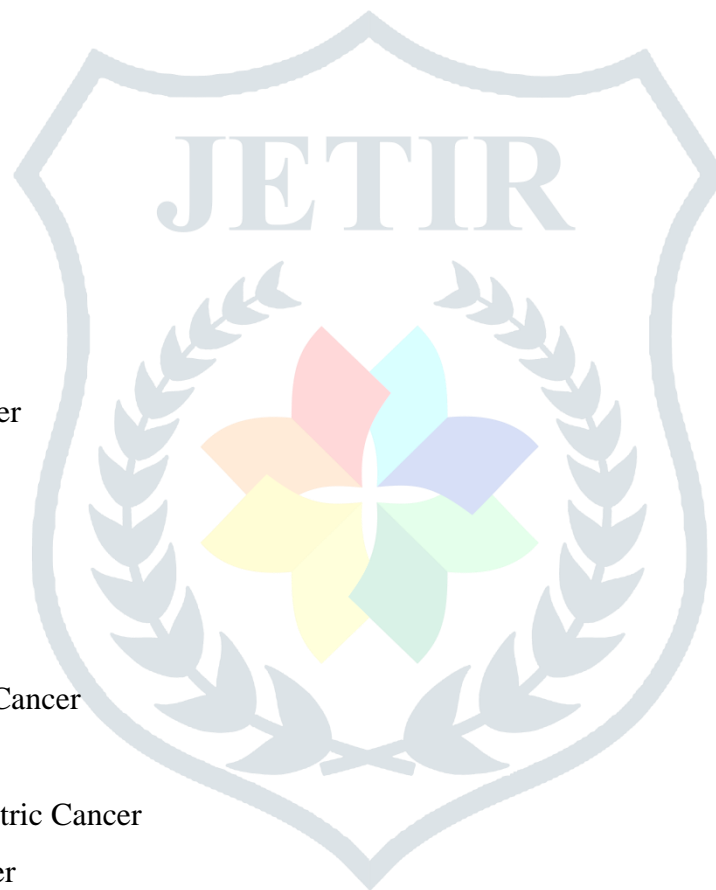
Leukemia is a bone marrow malignancy, which produces blood cells.

- Immune system malignancies include lymphoma and myeloma.

The resources listed below can help you learn more about particular cancer kinds.

- Appendix Cancer
- Bladder Cancer
- Bone Cancer
- Brain Cancer
- Breast Cancer
- Cervical Cancer
- Colon Or Colorectal Cancer
- Duodenal Cancer

- Ear Cancer
- Endometrial Cancer
- Esophageal Cancer
- Heart Cancer
- Gallbladder Cancer
- Kidney Or Renal Cancer
- Laryngeal Cancer
- Leukemia
- Lip Cancer
- Liver Cancer
- Lung Cancer
- Lymphoma
- Mesothelioma
- Myeloma
- Oral Cancers
- Ovarian Cancer
- Pancreatic Cancer
- Penile Cancer
- Prostate Cancer
- Rectal Cancer
- Skin Cancer
- Small Intestine Cancer
- Spleen Cancer
- Stomach Or Gastric Cancer
- Testicular Cancer
- Thyroid Cancer
- Uterine Cancer
- Vaginal Cancer
- Vulvar Cancer



CLASSIFICATION OF ANTI-CANCER DRUGS

Anti-drugs are two types:

1. Cytotoxic (non-specific)
2. Targeted (specific)

CYTOTOXIC:

Alkylating agents

Platinum compounds

Anti-metabolites

Mitotic spindle inhibitors

Topoisomerase inhibitors

Miscellaneous

TARGETED:**Small molecules**

Tyrosine kinase inhibitors

Proteasome inhibitors

PARP inhibitors

CdK inhibitors

CHEMOTHERAPY**ANTICANCER DRUGS:****Large molecules**

Monoclonal antibodies

Immunotoxins

HEXALEN: prescription drug called hexalen is used to treat the signs and symptoms of recurrent ovarian cancer. Hexalen may be taken by itself or in combination with other drugs. Hexalen is a member of the antineoplastic, alkylating drug subclass. Hexalen's safety and effectiveness in youngsters are unknown.

SIDE EFFECT:

Serious negative effects of hexalen include:

hives, breathing issues, swelling of the face, lips, tongue, or throat, intense numbness, tingling, or cold sensation in your hands or feet, severe or persistent vomiting, fever, chills, flu-like symptoms, mouth sores, pale skin, quick bruising, or bleeding, unusual weakness, lightheadedness, severe dizziness, spinning sensation, seizure, upper stomach pain, dark urine, clay-colored stools, and yellowing of the skin or eyes.

ELSPAR:

A prescription drug called Elspar is used to treat the signs and symptoms of acute lymphoblastic leukaemia. Elspar may be taken either by itself or together other drugs.

Elspar is a member of the Enzymes, Oncology medication subclass. Elspar's safety and effectiveness in youngsters are unknown.

SIDE EFFECT:

Elspar's most typical side effects include:

visual problems, thirst, headaches, nausea, vomiting, abdominal discomfort, fever, skin rashes, abnormal lab results, diarrhoea, and warmth, pain, redness, and swelling in your leg.

CARMUSTINE:

Brain tumours, Hodgkin's disease, multiple myeloma, and non-Hodgkin' lymphoma are all conditions that are treated with carmustine.

Carmustine is occasionally used in combination with other cancer medications, radiation therapy, or brain surgery. Other uses for carmustine that aren't covered in this drug guide are also possible.

SIDE EFFECT:

If you have any of the following symptoms of an allergic reaction, get immediate medical attention: hives; trouble breathing; swelling of your face, lips, tongue, or neck.

An infusion reaction could occur at the injection or two hours later. Redness of the skin, the eyes, and intense warmth or tingling under the skin are possible symptoms of this. A few weeks or even years after receiving carmustine, some negative effects might not manifest right away.

DIETHYLSTILBESTROL (DES) (STILBESTROL):

Diethylstilbestrol (DES), commonly referred to as stilbestrol or stilboestrol, is a non-steroidal oestrogen that is currently used very infrequently. It was once often used for a number of reasons, such as pregnancy support for women with a history of recurrent miscarriage, hormone therapy for menopausal symptoms and oestrogen shortage, treatment of breast and prostate cancer, and other uses. By 2007, it was only applied to the management of breast and prostate cancer. Hoover and colleagues published a study in 2011 that examined the negative health effects of DES, including infertility, miscarriage, ectopic pregnancy, preeclampsia, preterm

birth, stillbirth, infant mortality, menopause before age 45, breast cancer, cervical cancer, and vaginal cancer. DES was accessible for usage by several routes, although being most frequently given orally.

SIDE EFFECT:

When taken in doses greater than 1 mg per day, DES is linked to significant rates of adverse effects, such as bloating, nausea, vomiting, abdominal pain, and headache (15–50%).

PLICAMYCIN:

Plicamycin is an antineoplastic antibiotic made by *Streptomyces plicatus*, also known as mithramycin (INN) and sold under the trade name Mithracin. It is an inhibitor of RNA production. In 2000, the manufacturer stopped making products. A 1999 study re-examined the substance and presented a new structure. Several distinct structures are being reported in various locations, all having the same chromomycin core but with varying stereochemistry in the glycoside chain.

SIDE EFFECT:

Harm to the Liver, Kidneys, and Bone Marrow.

BENDAMUSTINE:

Non-lymphoma Hodgkin's is one type of lymphatic system cancer that is treated with bendamustine (NHL). Depending on what your doctor decides, it might also be applied to the treatment of other cancers. It can be used alone or in conjunction with a few other drugs.

SIDE EFFECTS:

Anemia (low number of red blood cells),

Decreased white blood cell count,

Infection,

Fatigue,

Nausea,

Vomiting \s Fever,

Low blood platelets,

Infection of the Mucosa.

CHEMOTHERAPY:

Cancer treatments is chemotherapy. It eliminates cancer cells by using medications. Your body's cells typically undergo controlled growth and ageing. Cancerous cells continue to multiply unchecked. Chemotherapy works by destroying cancer cells, preventing their spread, or reducing their rate of growth.

Chemotherapy helps with: Treatment options for cancer include curing it, reducing the likelihood that it will come back, or halting or decreasing its growth.Reduce tumours that are causing pain and other issues to lessen cancer symptoms.

SIDE EFFECT:

Cancer cells aren't the only thing that chemotherapy kills. It can potentially create negative effects by damaging some healthy cells.

You could experience many, few, or no adverse effects at all. Depending on your body's response and the type and quantity of chemotherapy you receive.

Typical negative effects include:

Oral sores,Fatigue, Vomiting, nauseous feeling and hair fall.

LENALIDOMIDE:

Lenalidomide is a drug used to treat multiple myeloma, smouldering myeloma, and myelodysplastic syndromes. It is marketed under the trade name Revlimid among other names (MDS). It is typically administered along with dexamethasone and after at least one additional treatment for multiple myeloma. It is consumed orally.

SIDE EFFECT:

Diarrhea, itching, joint pain, fever, headaches, and difficulties sleeping are typical side effects. Low blood platelets, low white blood cells, and blood clots are among the serious adverse effects. Use when pregnant could be harmful to the foetus. For those who have kidney issues, the dose may need to be changed. Though it has a molecular structure comparable to thalidomide, its mode of action is distinct. As of 2019, its mechanism is not completely understood.

MARKETING SURVEY OF INDIA:**Table 1:**

S. No.	Brand Name	% Monthly sale	Manufacturer
1.	Chemotherapy		
2.	Lenalidomide	8.2%	NATCO
3.	Bendamustine	4.9%	Dr. Reddy's
4.	Plicamycin	3.8%	Enomark

$$\% \text{ Monthly sale of particular drug} = \frac{\text{Monthly sale of drug} \times 100}{\text{Total monthly sale under the category}}$$

Table2: Commonly available drug categories for Anti cancer drugs:

S. No.	Drug category	Percentage
1	Alkylating agents	14.50%
2	Others	16.50%
3	Chemotherapy	19.70%

Total monthly sale under the Category.

In India, about 14 lakh new cases of the disease are identified each year, and 8.5 lakh patients pass away from it. This is a national issue that calls for coordinated action, a targeted approach, and committed funding.

Early cancer detection can improve results for many different cancer types. And some individuals require more frequent screening than others. For instance, having a family history can raise your risk, and certain diseases are more prevalent in particular racial and ethnic groups. Based on your risk factors, your doctor will develop a specific screening programme.

Chemotherapy is an aggressive type of chemical medicinal treatment designed to kill the body's rapidly proliferating cells. Since cancer cells grow and divide more quickly than other cells, it is typically utilised to treat cancer.

Gemcitabine cancer medications in India are nucleoside analogues that are given to patients receiving chemotherapy for cancers such as lung, pancreatic, breast, and ovarian. Power: 200 mg and 1 gm.

CONCLUSION:

After the market survey of anti-cancer drugs, we found that most of the people are suffering from breast cancer. 48% of men are affected from cancer, 56% of women are affected from cancer and 4% of children are affected from cancer.

Chemotherapy, Bendamustine, Plicymin, Lenalidamide are most useful medicines in the treatment of cancer. Malnutrition, high tobacco consumption and poor ventilation in buildings, coupled with low socio-economic status leads to cancer. As we know that, cancer is non communicable disease, the cancer disease are spreadily very fast. Now we conclude that, most of the people are aware of cancer. the cancer is spreading a lot in India and cancer is the most spreadable disease.

Cancer is not curable disease, this disease is prevent only chemotherapy, immuno therapy and other medication use.

REFERENCE:

World Health Organization 12 September 2018. Retrieved 19 December 2018.

Anand P, Kunnumakkara AB, Sundaram C, Harikumar KB, Tharakan ST, Lai OS, Sung B, Aggarwal BB (September 2008). "Cancer is a preventable disease that requires major lifestyle changes". *Pharmaceutical Research* : 2097–116.

"Defining Cancer". National Cancer Institute. 17 September 2007. Retrieved 28 March 2018.

World Cancer Report 2014. World Health Organization. 2014. pp. Chapter 1.1. Archived from the original on 12 July 2017.

Pawelec G, Derhovanessian E, Larbi A (August 2010). "Immunosenescence and cancer". *Critical Reviews in Oncology/Hematology*. **75** (2): 165–72.

Alfarouk KO, Stock CM, Taylor S, Walsh M, Muddathir AK, Verduzco D, et al. (15 July 2015). "Resistance to cancer chemotherapy: failure in drug response from ADME to P-gp". *Cancer Cell International*. **15** (1): 71.

Rajman L, Chwalek K, Sinclair DA (2018). "Therapeutic Potential of NAD-Boosting Molecules: The In Vivo Evidence". *Cell Metabolism*. **27** (3): 529–547.

"Bendamustine Hydrochloride". The American Society of Health-System Pharmacists. Archived from the original on 21 December 2016. Retrieved 8 December 2016.

British national formulary: BNF 69 (69 ed.). British Medical Association. 2015. p. 579.

Tageja N, Nagi J (Aug 2010). "Bendamustine: something old, something new". *Cancer Chemotherapy and Pharmacology*. **66** (3): 413–23.

Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. *CA: A Cancer Journal for Clinicians* 2022; 72(1):7-33.

American Cancer Society. "Melanoma Skin Cancer". *American Cancer Society*. American Cancer Society. Retrieved 5 July 2017.

Kennedy, B.D., et al: *Cancer Res.* 27:1534, 1967.

Jones, R.B., et al: Safe handling of chemotherapeutic agents: A report from the Mount Sinai Medical Center. *Ca A Cancer Journal for Clinicians*, Sept/Oct. 258-263, 1983.

WHO: World Health Statistics 2019: Monitoring Health for the SDGs. Geneva, Switzerland, World Health Organization, 2018.

Noller KL, Fish CR (July 1974). "Diethylstilbestrol usage: Its interesting past, important present, and questionable future". *Med. Clin. North Am.* **58** (4): 793–810.

Elks J (14 November 2014). *The Dictionary of Drugs: Chemical Data: Chemical Data, Structures and Bibliographies*. Springer. pp. 396.

uhl H (August 2005). "Pharmacology of estrogens and progestogens: influence of different routes of administration"(PDF). *Climacteric*. **8** (Suppl 1): 3–63.

oelingh Bennink HJ, Verhoeven C, Dutman AE, Thijssen J (January 2017). "The use of high-dose estrogens for the treatment of breast cancer". *Maturitas*. **95**: 11–23.

Silverman RB, Holladay MW (January 2014). "Chapter 6 - DNA-Interactive Agents". In Silverman RB, Holladay MW (eds.). *The Organic Chemistry of Drug design and Drug Action* (Third ed.). Boston: Academic Press. pp. 275–331.

Rider, Barbara J. (2007-01-01), Enna, S. J.; Bylund, David B. (eds.), "Carmustine", *xPharm: The Comprehensive Pharmacology Reference*, New York: Elsevier, pp. 1–4.

Vitamin D Handbook, Hoboken, NJ, USA: John Wiley & Sons, Inc., pp. 239–244, 2007.

The American Society of Health-System Pharmacists. Archived from the original on 27 March 2017. Retrieved 8 December 2016.

"Asparaginase escherichia coli (Elspar) Use During Pregnancy". *www.drugs.com*. Archived from the original on 27 March 2017. Retrieved 20 December 2016.

Avramis VI, Sencer S, Periclou AP, Sather H, Bostrom BC, Cohen LJ, et al. (March 2002). "A randomized comparison of native *Escherichia coli* asparaginase and polyethylene glycol conjugated asparaginase for treatment of children with newly diagnosed standard-risk acute lymphoblastic leukemia: a Children's Cancer Group study". *Blood*. **99** (6): 1986–94.

Other antineoplastic drugs". *British National Formulary (BNF 57)*. United Kingdom: BMJ Group and RPS Publishing. March 2009. p. 476.

ornbrust BA, Stringer MA, Lange NE, Hendriksen HV, Whitehurst R, Oort MV (2010). "Enzymes in food technology.". In Whitehurst RJ, Van Oort M (eds.). *Asparaginase—an enzyme for acrylamide reduction in food products*. Vol. 2. UK: Wiley-Blackwell. pp. 59–87.

