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REVIEW ON ANTI-CANCER ACTIVITY OF VINCA

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ABSTRACT:

Herbal anticancer drugs are mostly made from Cantharanthus roseus because the way these anticancer drugs work is important. When cells in the body grow abnormally, it can lead to death. It is the biggest health problem in both developed and developing countries. Some cancers can be prevented using chemopreventive agents, many of which are natural products that are effective in stopping the process of cancer formation. There are many medicines available in the market that are used to treat different types of cancer, but there is no single drug that has been proven to be completely effective against cancer. These days, people are more likely to use traditional and herbal medicines as part of cancer treatment. Most of the chemotherapy drugs used today for cancer are known to cause resistance, are not selective and can harm normal cells, and are limited by serious side effects that restrict the dose given. So, finding a cure for cancer and developing new drugs for this disease is still a big challenge in medicine. However, plants are a great source of natural products that have biological activity. They are popular because the materials are easy to find, they are affordable, they are not very expensive, they have fewer or no side effects, and they have a wide range of benefits and effective healing properties, which has helped to push forward scientific studies. In this review, we have summarized the vinca plant and its ability to fight cancer.

KEYWORDS: Herbal medicines, Natural products, Chemotherapy, Anticancer drug, Cancer cell.

INTRODUCTION:

For thousands of years, special products from the environment, especially herbs, have been used to treat many different illnesses. Native herbs have been used as medicine in Egypt,

China, India, and Greece for a long time, and many modern drugs have come from these traditional remedies. The earliest known written records about using herbs for healing date back to around 2600 BC, and they come from the Sumerians and Akadians. Cancer is a serious illness caused by genetic problems, and it might be the most important type of disease that can be treated using plants used for medicine. Every year, millions of people find out they have cancer, and in most cases, it ends in death. Cancer is a rare type of cell growth in our body that can cause death. Cancer cells usually spread and destroy normal cells. These cells appear because of differences in the body, and if we fix those differences, the cancer might be treated. Many billions of dollars have been spent on researching cancer, but we still don't fully understand what causes it. Every year, millions of people are checked for cancer, and many of them pass away because of it. According to the American Cancer Society, deaths caused by cancer make up about 2.3% of all deaths that happen each year around the world. Cancer causes the death of around 3500 million people each year worldwide. Several cancer treatments use chemopreventive agents, but these treatments can cause harmful side effects, which make them hard to use. The higher costs of traditional treatments like chemotherapy and radiation, along with the lack of effective drugs to cure solid tumors, made people in different countries more likely to rely on traditional medicine, which uses healing herbs. These herbs can create a nearly endless supply of materials that draw researchers looking for new and innovative cancer treatments. Of more than 2069 anticancer clinical trials recorded by the National Cancer Institute as showing improvement by July 2004, over 160 are groups of drugs, and these drugs are used to treat various types of cancer.

Cancer:

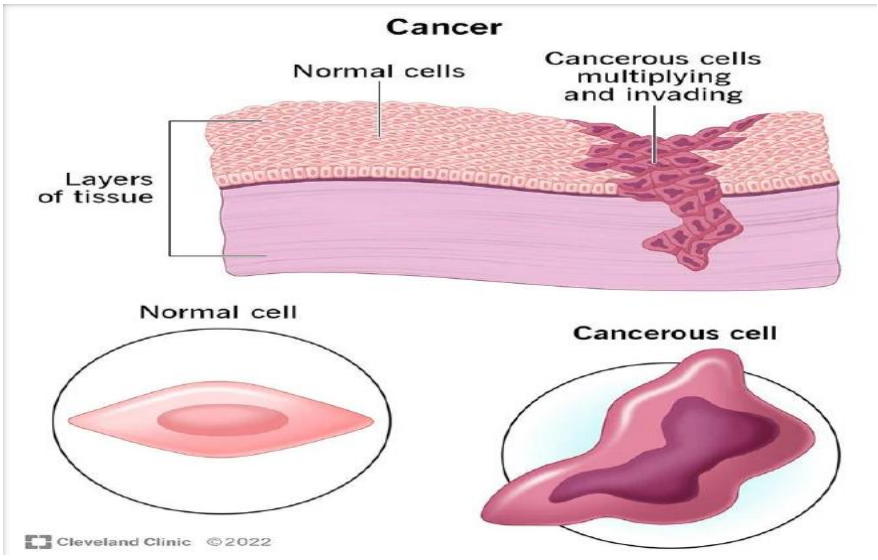

Fig.:no 1.

Cancer is a universal term pragmatic series of malignant syndromes that man move different parts of body. These syndromes are categorised by a rapid and uninhibited formation of unusual cells, which may mass collected to form a growth or tumour, or proliferate throughout the body, starting unusual growth at other sites If the procedure is not prevented, it may development until it reasons the demise of the organism, the main procedures of cure for progress stage cancer in peoples are surgery, energy and drugs (cancer chemotherapeutic agents) Cancer chemotherapeutic causes can often provide impermanent relief of suggestions, prolongation of life, now and then cures. In current years, a lot of struggle has been applied to the production of potential anticancer drugs.

Many hundreds of chemical variants of known class of cancer chemotherapeutic agents have been produced but have a more adverse effects. A successful anticancer drug should kill or incapacitate cancer cells without causing unnecessary destruction of usual cells. This ideal is difficult, or perhaps difficult, to attain and is why cancer patients frequently suffer unkind adverse effects when undergoing treatment. However, a waste amount of synthetic work has given relatively small improvements over the prototype drugs. There is a continued need for new prototype new templates to use in the design of potential chemotherapeutic agents: natural products are providing such templates. Recent studies of tumour inhibiting compound of plant origin have yielded an impressive array of novel structure.

Types of cancer:

1) Cancer of body and lymphyatic Systems

a) Hodgkin's Disease

b) Leukaemia's

c) Lymphomas

d) Multiple myeloma,

e) Waldenstrom'sdisease

2) Skin Cancers

a) Malignant Melanoma

3) Cancers of digestive system

a) Esophageal cancer

b) Stomach cancer

c) Cancer of Pancreas

d) Liver cancer

e) Colon and Rectal cancer

f) Anal cancer

4) Cancers of urinary system

a) Kidney cancer

b) Bladder cancer

c) Testis cancer

d) Prostate cancer

5) Cancer in women

a) Breast cancer

b) Ovarian cancer

c) Gynaecological cancer

d) Choriocarcinoma

6) Miscellaneous cancers

a) Brain cancer

b) Bone cancer

c) Characinoid cancer

d) Nasopharyngeal cancer

e) Retroperitoneal sarcomas

f) Soft tissue cancer

g) Thyroid cancer

Plant Derived Anti-Cancer drug

VINCA ALKALOID:

Catharanthus is a type of tropical plant that grows year after year. It is a medicinal herb and belongs to the Apocynaceae plant family. This family has eight species, seven of which are found only in Madagascar. These include Catharanthus longifolius, C. trichophyllus, C. coriaceus, C. lanceus, C. ovalis, C. roseus, and C. scitulus. The eighth species, C. pusillus, is found in India. C. roseus is a plant that is both beautiful and useful for medicine because it acts like a chemical factory, making over 130 different terpenoid indole alkaloids (TIAS). Some of these chemicals have strong and important effects on health. Vinca alkaloids are a type of medicine that comes from the Madagascar heliotrope plant. They are naturally taken out from the pink heliotrope plant called Catharanthus roseus. It also causes low blood sugar and can harm cells. The vinca alkaloids are also important because they fight cancer. There are four main vinca alkaloids used in testing: Vinblastine (VBL), vinorelbine (VRL), vincristine (VCR), and vindesine (VDS). VCR, VBL, and VRL have been approved for use

in the United States. Vinflunine is a new type of synthetic drug called a vinca alkaloid. It has been approved in Europe to treat a type of cancer called second line provisional cell carcinoma of the urothelial. Doctors are also looking into using it for other types of cancers.

Fig.:no 2.

Vinca alkaloids are a significant group of drugs used to treat cancer. Vinca alkaloids work by stopping cells from dividing properly. They do this by interfering with the way microtubules function during cell division, which leads to a specific block in the cell division process. This block eventually causes the cells to undergo programmed cell death, known as apoptosis. Vinca alkaloids include Vinblastine (VLB) and Vincristine (VCR), as well as Vinorelbine (VRLE) and Vindesine (VDS). These drugs are extracted from the Madagascar periwinkle, Catharanthus roseus. Don (Apocynaceae). I. Vinblastine, also known as VLB, is a major naturally occurring active compound. Vinblastine sulphate is the salt form of an alkaloid that is extracted from Vinca rosea Linn., a common flowering herb commonly referred to as periwinkle. It is more accurately known as Catharanthus roseus G. Don).

Before, the general name was vinca leukoblastine, which was shortened to VLB. It is a stathmokinetic oncolytic agent. When this preparation is used in a lab setting, it stops growing cells from moving forward and keeps them in the metaphase stage. II. Vincristine, which is also known by its brand name Oncovin, was originally called leurocristine and is sometimes referred to as VCR. It is a type of vinca alkaloid that comes from the plant

Catharanthus roseus, which is also known as the Madagascar periwinkle. This plant was previously called Vinca rosea, which is where the name originated. It works by stopping cells from dividing and is used to treat cancer through chemotherapy.

Vincristine is made by combining two types of alkaloids, vindoline and catharanthine, which are found in the vinca plant. III. Vinorelbine is the first 5 NOR semisynthetic vinca alkaloid. It is made through semi-synthesis using alkaloids taken from the rosy periwinkle plant, Catharanthus roseus. IV. Vinflunine is part of a class of medications called vinca alkaloids. Vindesine is a type of chemotherapy drug called an anti-mitotic vinca alkaloid. It is used to treat cancer by slowing down the growth of cancer cells.

Mechanism of action of Vinca:

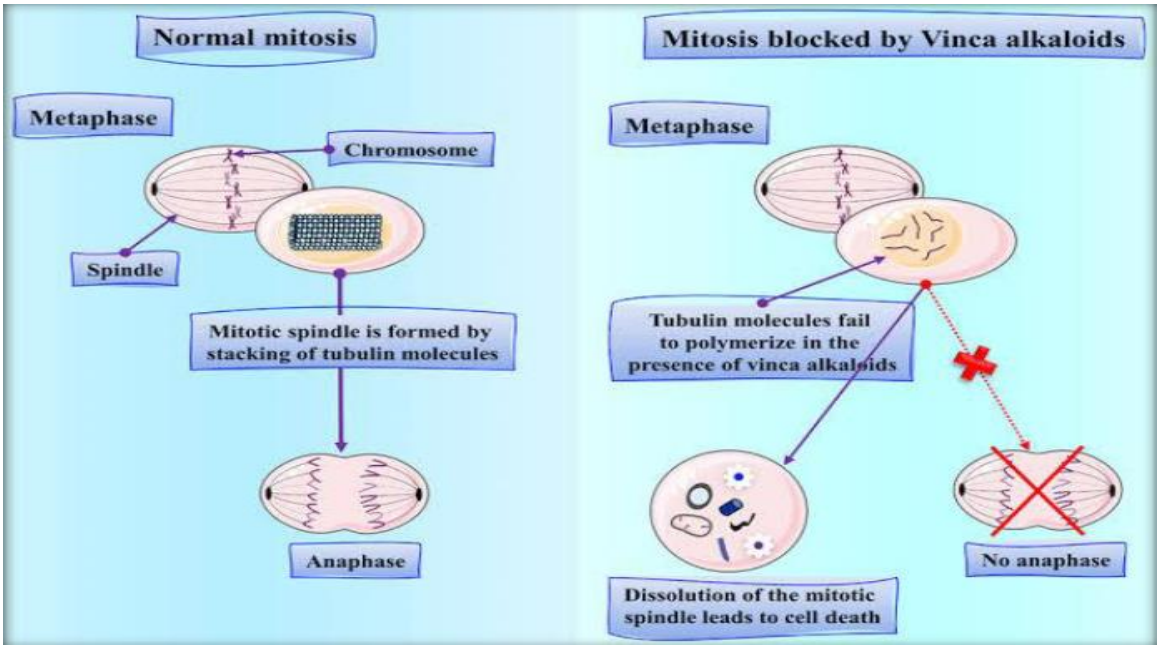

Fig.:no 3.

The vinca alkaloids stop cells from dividing by preventing them from properly capturing the chromosomes during the metaphase stage. Their antitumor effect is due to their strong ability to bind with intracellular tubulin, which is the protein building block of the spindle microtubules. The binding coefficients for vincristine, vinblastine, and vindesine to tubulin are 8, 6, and 3.3 nanomolar per liter respectively. The formation of structures between vinca alkaloids and tubulin stops the tubulin subunits from forming microtubules, leading to the breakdown of existing microtubules and affecting the ability to build new ones. Since microtubules are also important for moving neurotransmitter materials along nerve cell axons, vinca alkaloids can cause damage to the nervous system, especially in high doses.

CONCLUSION:

Therapeutic plants help keep people healthy and full of energy, and they can also treat many illnesses, including cancer, without causing harmful side effects. Natural products found in medicinal plants have been significant in the treatment of cancer. This review presents various anti-cancer plants that contain vine alkaloids. These plants have beneficial properties that help reduce diabetes and fight oxidative stress, which can also help prevent cancer. In conclusion, this article gives information about the anticancer treatment derived from the Vinca plant, which is originally from abroad and is used by people all around the world. It is also important to discover new cancer treatments from medicinal plants. Without this early warning system, dealing with the development of chemo resistance becomes a major challenge.

In an ideal scenario, therapy would be customized for each person from the beginning; however, this is not likely to happen soon, even though there has been quick advancement in pharmacogenomics. In the meantime, having a better understanding of how resistance works can help the doctor adjust the treatment as needed. Medicinal plants have provided a lot of health benefits to humans. Plant extracts and the active substances they contain, which are known to have cancer-fighting properties, need to be tested to gather important information about their benefits. This review highlighted that the vinca plant has anticancer properties effective against different kinds of cancer.

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