



A Review on Multidirectional Holistic Approach and Impact of Adjuvants for the Treatment of Cancer

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ABSTRACT

Cancer is the leading cause of morbidity and mortality worldwide. It can affect any part of the body and there are various management strategies for each specific type of cancer. It is one of the non-communicable diseases that is being occurring in developing and also in the developed countries. Approximately around 1500 BC, the earliest cancer growth was found in Peruvian and Egyptian mummies. According to National Cancer Institute reports of 2019, 6 million deaths have been observed. The major causes of deaths are due to life-style modification, urbanization, industrialization etc. The main goal in treating cancer is to eradicate it, but if it's not achieved then the treatment is shifted to palliative care, relieving the symptoms and maintaining the quality of living of the patients. The management of this disease including the therapeutic aspects that are to be used are described in the classical text books of Indian system of medicine. The oral health traditions that are formed are given by the traditionally trained physicians of village, folk healers, tribes people, and written on the palm leaves. The main aim of switching to alternative system of medicine is to reduce the adverse effects that are being occurring due to the conventional chemotherapeutic drugs. The rationale of this review is to highlight the therapeutic aspects of treating cancer by alternative system of medicine (AYUSH).

Keywords: Cancer, Ayurveda, Unani, Siddha, Homeopathy, Yoga.

INTRODUCTION

According to WHO cancer is defined as a generic term for about 100 different diseases which is characterised by uncontrolled division or multiplication of cells that invade into other parts of the body or spread into different organs from its origin.¹ Cancer can affect any part of the body and there are various management strategies for each specific type of cancer.² Based on the site of origin and tissue that is affecting, cancer is classified³ into;

I. Lymphoma⁴

This is a type of cancer that occurs in lymphatic system that mainly includes spleen, thymus, lymph nodes and bone marrow.

Main symptoms include swelling or enlargement of lymph nodes, weight loss, fatigue

a. Non-Hodgkin's lymphoma: this type of cancer originates in lymphatic system and spreads throughout the body.

B-cell lymphoma: its cancer occurring in B cells of immune system

T-cell lymphoma: its cancer that is occurring in T lymphocytes.

Burkitt's lymphoma: it's a lymphatic cancer that is caused due to Epstein-Barr virus.

Follicular lymphoma: this is a type of cancer that occurs due to uncontrolled division of centrocytes and centroblasts of B cells.

Mantle cell lymphoma: it is the over expression and mutation that is occurring of cyclin D1 a cell cycle gene, that leads to abnormal proliferation and malignancy of B cells.

Lymphoplasmacytic lymphoma: it is the uncontrolled proliferation of both B lymphocytes and also the plasma cells.

b. Hodgkin's lymphoma: this also affects the lymphatic system but the cancer occurs only in the upper part of the body like arm pits, neck. The physician confirms the presence of cancer by reed-sternberg cells.

Lymphocyte depleted Hodgkin's disease: it contains only few numbers of normal lymphocytes and large number of reed-sternberg cells in lymph nodes, this type of cancer is most frequently seen in AIDS patient.

Lymphocyte rich Hodgkin's disease: it contains enormous numbers of both normal lymphocytes and also the reed-sternberg cells in lymph nodes which is most common in males.

Mixed cellularity Hodgkin's lymphoma: the lymph nodes contains heterogenous cells of reed-sternberg cells, histiocytes, eosinophils plasma cells, small lymphocytes, and most common older adults.

Nodular sclerosis Hodgkin's lymphoma: the lymph nodes contains numerous numbers of fibrous tissue elements that is due to sclerosis that is occurred of the nodes.

II. Leukemia⁵

This is a type of cancer that occurs in the body for the blood forming tissues that includes the bone marrow too. Main symptoms include bleeding, bruising, fatigue, weight loss and frequent infections.

Acute lymphocytic leukemia: it is the most rapid growing cancer that occurs to the blood cells, bone marrow and increase in WBC cells.

Acute myeloid leukemia: it is the abnormal division of the myeloid lining of the blood cells that is occurring where the abnormal blood cells get built up in bone marrow.

Chronic lymphocytic leukemia: it is the cancer of blood cells and bone marrow. But the progression of the disease is very slow.

Chronic myeloid leukemia: it is due to the abnormal division of cells in bone marrow due to the mutation that is occurred due to the BCR-ABL gene.

III. Carcinoma⁶

This occurs in the cells that make up the skin and other vital organs like kidney, liver. Main symptoms include blood in urine, itching in the anal region, swollen glands, and indigestion

Basal cell carcinoma: it's the cancer that occurs in the deepest part of the skins outer layer.

Renal cell carcinoma: this is a type of cancer that occurs into the kidney, it grows as a single tumor.

Invasive ductal carcinoma: it's the type of breast cancer that occurs in the milk ducts and spreads to the fat tissues.

Squamous cell carcinoma: it's the cancer that occurs on the skin mostly seen on neck, face lips.

Melanoma: this is a type of cancer that occur in the melanocytes that are responsible for pigmentation.

IV. Sarcoma⁷

This is cancer that is occurring in the mesenchymal cells which are usually responsible for making up of bones and soft tissues. Main symptoms include swelling, pain in the affected area.

Bone sarcoma: this is a type of cancer that occur in the long bones like femur, radius, ulna.

Desmoid-type fibromatosis: this is a benign tumor that occurs in the connective tissue of leg, abdomen and arms.

Chondrosarcoma: this is a type of cancer that occurs in the cells that are responsible to produce tissue to form cartilage.

Angiosarcoma: this is a type of cancer that occurs in the blood vessel linings and lymph vessel linings.

Ewing's sarcoma: it's a cancer type where it is seen in and around the bones and most commonly seen in children.

Fibroblastic sarcoma: cancer that develops in the fibrous tissue, this is most commonly seen in skin, trunk and in limbs.

Gastrointestinal stromal tumors: it is cancer seen in stomach and intestine, it is developed from a specialised cell in GI tract that is Interstitial Cells of Cajal (ICCs).

Gynaecological sarcoma: these are the type of uncommon tumors that occurs in uterus, but these are originated from ovary or broad ligament.

Kaposi's sarcoma: these are cancer that forms patches of abnormal layer under the skin, lining of mouth, nose, throat and these patches are in the form of lesions and remain in red or purple colour.

Leiomyosarcoma: these are cancer that occurs in the smooth muscles and are mainly seen in abdomen.

Liposarcoma: these are cancer that occurs in the in the fat cells like adipose tissue, and is most commonly seen in the thigh region.

Neurofibrosarcoma: these are the cancer that is occurring in the cells that is surrounding the peripheral nerves (that receives messages from the CNS).

Synovial sarcoma: the cancer is seen in the extremities of arms and legs, in the proximity to joint tendon sheath.

Rhabdomyosarcoma: it is an aggressive type of cancer that is seen in the striated muscles. It's a highly malignant form.

Retroperitoneal sarcoma: this cancer occurs in the retroperitoneum region, it's an area behind the peritoneum that lines the abdomen and covers the abdominal organs.

Adenosarcoma: this type of cancer that occurs in the glandular cells that is responsible for production of mucus and other essential fluids.

V. Mixed type⁸

This is a type of cancer which have components of two or more cancers.

Teratocarcinoma: these are tumors that occur in the germ cells of various tissues that corresponds to somatic and extraembryonic cells.

Mixed mesodermal tumor: this is a type of cancer that occurs in the epithelial and connective tissue like uterus, fallopian tube and other parts of the body containing these tissues.

Carcinosarcoma: this cancer is combination of sarcoma and carcinoma, seen in organs like lungs, pancreas, and salivary glands.

Adenosquamous carcinoma: this is a type of mixture cancer that occurs in squamous cells (thin, flat layer that lines vital organs and gland cells).

BRIEF HISTORY OF CANCER

Tumor was first identified in fossils of dinosaurs. Large scale screening of 10000 specimens of the dinosaurs was carried out by fluoroscopy to find the evidence of tumors and further assessment was done to find out the abnormalities by the application of CT (Computerised Tomography). By carrying out screening for specimens, benign tumors like desmoplastic fibromas, osteoblastomas and hemangiomas was found in duck-billed dinosaurs (*Cretaceous hadrosaurs*) which lived approximately about 70 million years ago. Malignant tumors was found in 0.2 % of specimens of dinosaurs.⁹

Approximately around 1500 BC, the earliest cancer growth was found in Peruvian and Egyptian mummies. A Scythian king who lived around 2700 years ago was found with cancer which was the first documented human cancer whose age was about 40-50 years.¹⁰ The king was found with skeletal lesions and bearing prostate cancer with the application of modern proteomic and microscopic techniques.¹¹ (460 – 360 BC) Hippocrates the “**FATHER OF MEDICINE**” described cancer as it produces masses of cells and termed masses as *onkos* and coined the term of benign and malignant tumors as *karkinos* and *karkinomas* respectively.¹² (25BC – 50AD) Aulus Cornelius celsus described the tumor evolution from removable cacoethes (tumor) to the unrepentant invasive carcinomas.¹³ He also performed the first reconstruction operation following the removal of tumor and was credited for the same.¹⁴ (1523 – 1562 AD) Gabriele Fallopius described the clinical significances between the malignant tumors and benign tumors which is even applicable till today and was even credited for this purpose. He identified the woody firmness, multi-lobular having adhesion to neighbouring skin, bones and muscles having irregular shape, presence of congested blood vessels around the lesions, movable and called them as malignant tumors. In contrast to it the soft mass with regular shape and which does not adhere to other tissues but not movable as benign tumors.¹⁵

(1735 – 1804 AD) Bernard Peyrilhe’s, he formed the first doctoral thesis in which he carried out the first investigational procedure with a systematic study where he explored the cause of cancer, the nature of cancer, in what pattern the cancer grows and also provided information about how cancer can be treated.¹⁶ Hence Bernard Peyrilhe’s was then propelled as one of the founders to carry out experimental research on cancer. He put forth the existence of Ichorous matters it’s a cancer-promoting factor that is present in human body that is similar to virus this is emerging from the degraded or decomposed lymph. To test if this Ichorous matter was actually contagious in its nature he carried out an experimental research where he prepared a breast cancer extract and induced into a dog under its skin and observation of that dog was carried out in home itself but ultimately the experiment was a failure as it was interrupted by his servants as they drowned the dog for frequently howling.

Bernard Peyrilhe’s also brought in the concept origination of cancer and named it as distal disease consequent cancer. In the year 1829 a French gynaecologist (1774 – 1852 AD) Joseph Recamier coined the term as metastasis for distal disease consequent cancer. He is well known for promoting the use of vaginal speculum (an instrument for dilating the vaginal cavity to examine the female genitals.¹⁷ (1815 – 1865 AD) Robert Remak was best for his studies on bringing a link between the mature organs to embryonic germ cells. He postulated that all the cells are derived from the binary fusion that is occurring from the pre-existing cells and also stated that cancer formation is not new cells but transformations that is occurring in normal tissue with different site of origin. This took forward one step in knowing the aetiology of cancer.¹⁸ The first visualization of the sarcoma using X-ray was carried out in amputated leg was carried out by Franz Konig (1832 – 1910 AD).¹⁹ By painting coal tar in rabbits ears squamous cell carcinoma was induced for the first time by (1863 – 1930 AD) Katsusburo Yamagiwa with his assistant Koichi Ichikawa.²⁰ (1879 – 1970 AD) Peyton Rous proved the link between virus and cancer. He confirmed by inducing cancer in healthy chickens. He inoculated tumor from cancer-stricken fowl and injected with cell and bacteria free filtrate and injected to healthy chicken. There were no evidences about the nature of how the cancer is transmissible. This was the resemblance of the peyrlhe’s experiment that was performed in late 1700 AD. Because there were no evidences for many years he was away from the society and by many of the medical establishments this finding were rejected because it was challenging the principle view of genetic heredity if cancer. But after 50 years his momentum discovery was acknowledged and was given noble prize in the year 1966 for medicine or physiology. This discovery is now called as Rous sarcoma virus.^{21,22}

Health risk of cancer became known in society, increasing in public awareness and interests it stimulated responses by the policy makers which made a big attempt to address the causes symptoms and prevailing death due to cancer in national level as the enacted the national cancer act in 1937 promoted by US congress.²³

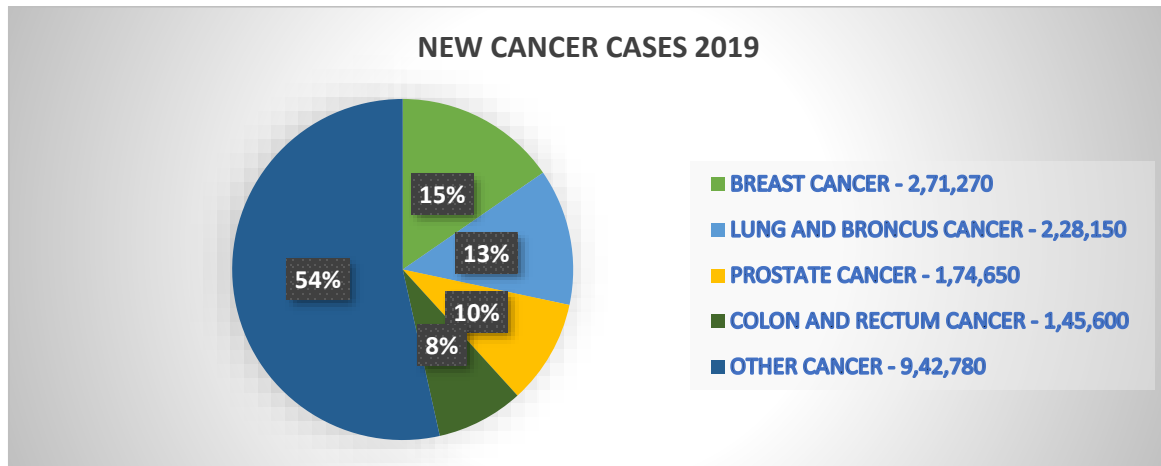
(1908 – 1984 AD) Alfred Gilman and (1906 – 2000 AD) Louis S Goodman assessed the therapeutic activity of mustard gas derivative. In their study nitrogen mustards an anticancer drug was found out where a nitrogen atom substituted the sulphur atom which was present on mustard gas.²⁴ Toxicity study was confirmed using rabbits as animal model using its blood cells. Anti tumor potential of this drug was carried out in mice xenograft model which was transplanted with lymphoid cancer.²⁵ The mustard gas was discovered or identified by (1833 – 1886 AD) Frederick Guthrie, this is a chemical agent which is a vesicant one that was used in warfare causing deaths of 91,198 in World War I that remained as a precursor for treatment of cancer as first drug.²⁶ This is when the chemotherapeutic era began.



EPIDEMIOLOGY OF CANCER²⁷

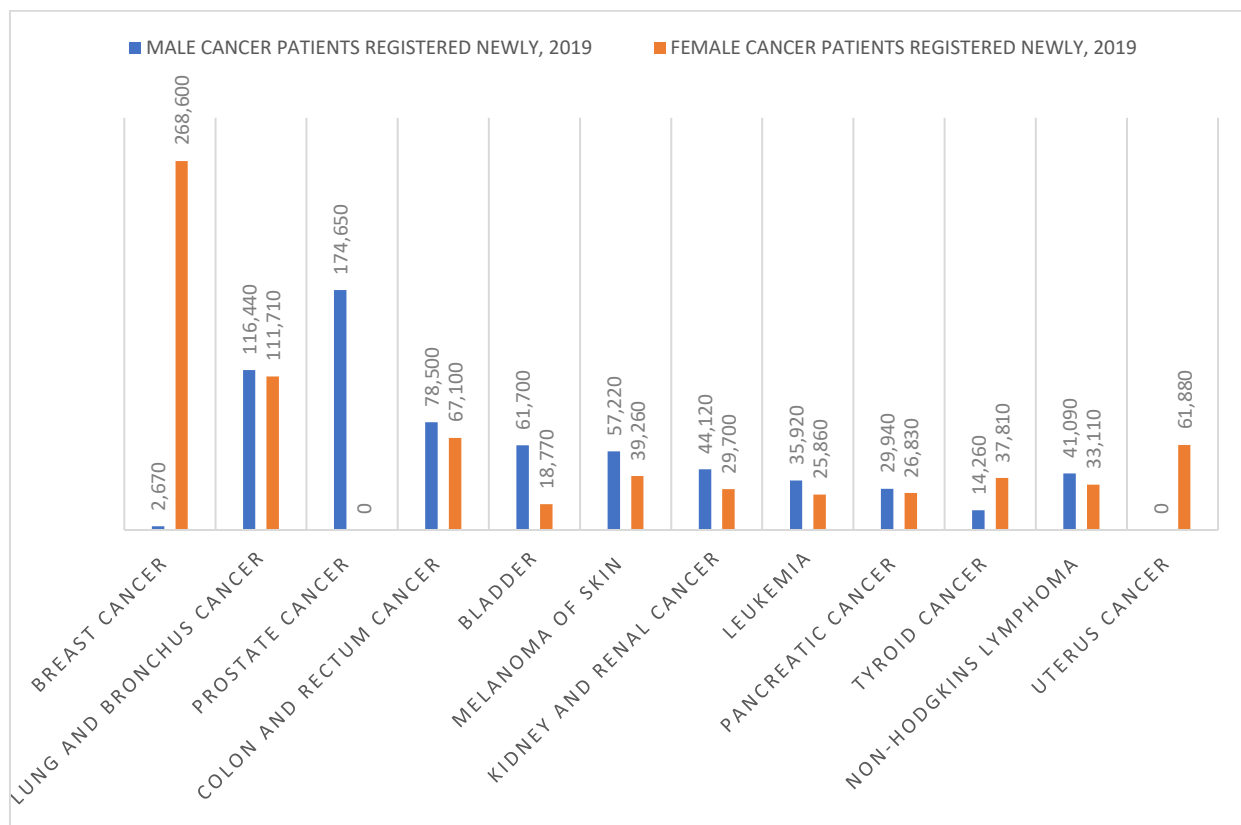
According to NATIONAL CANCER INSTITUTE in 2019, around 1.8 million people are diagnosed with cancer in US. Around 2,760 males and 2,68,600 females are diagnosed with cancer when breast cancer is considered.

Breast cancer remains the most common cancer that is seen in females most frequently. The second most common cancer that is seen is lung and bronchus cancer with an estimate of 2,28,150. Prostate cancer remains as the third most cancer around 1,74,650 cases diagnosed and is most frequently seen in males as new cases.



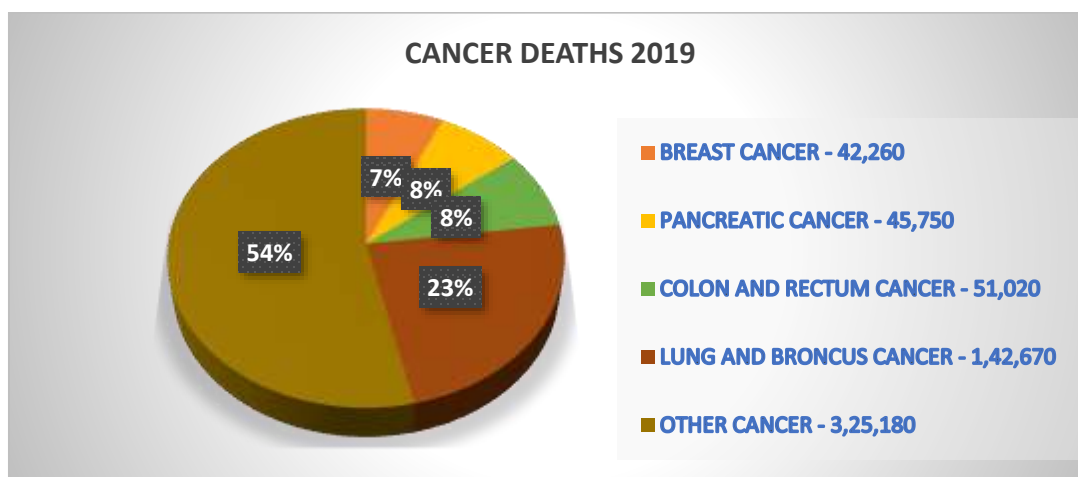
Graph 1: New cancer cases 2019

New cancer cases seen in 2019 (gender wise)



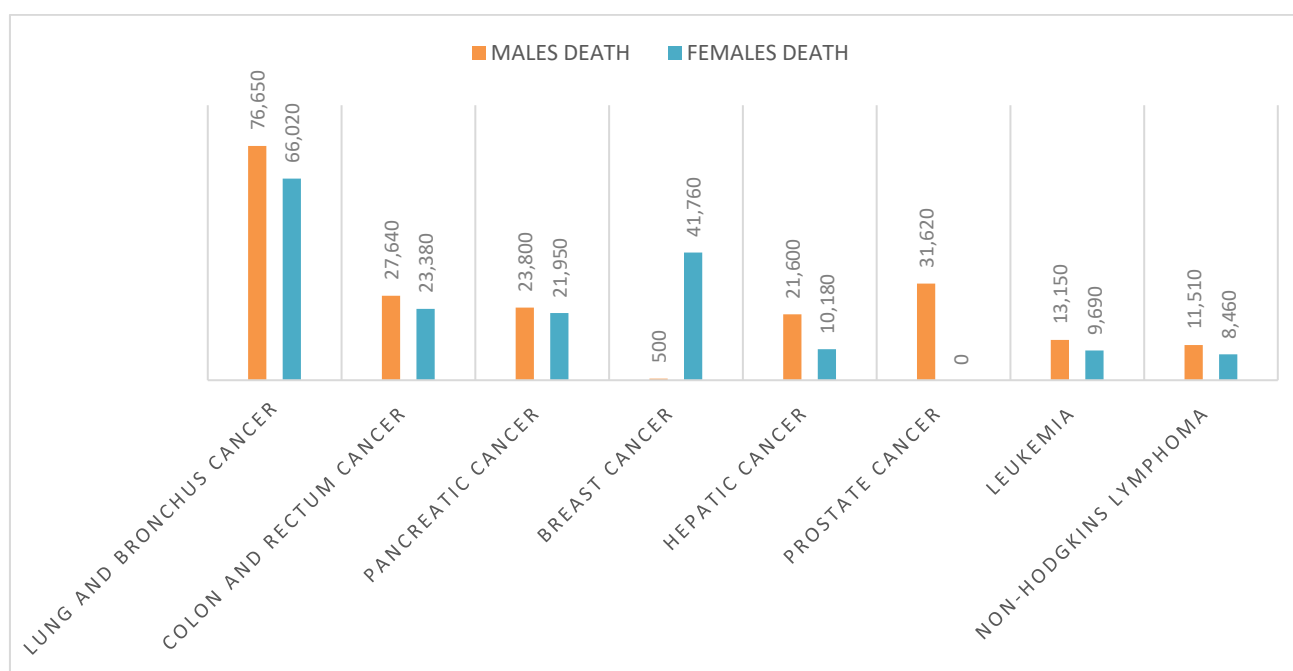
Graph 2: New cancer cases 2019 (GENDER WISE)

It is estimated that around 6,06,880 peoples died due to cancer in US in 2019, around 1,42,670 peoples died due to lung and bronchus cancer, this remains as the most common cancer that people die. Colorectal cancer remains as the second most cause of death, around people of 51,020. Pancreatic cancer caused death of around 45,750 peoples and is the third deadliest cancer disease.



Graph 3: Cancer deaths 2019

Cancer deaths seen in 2019 (gender wise)



Graph 4: Cancer deaths 2019 (GENDER WISE)

TREATMENT OF CANCER WITH ALTERNATIVE SYSTEM OF MEDICINE

India is known for the old and rich heritage for its traditional way for treating diseases. It has played a vital role in treatment of various diseases in the past and is doing it in present days and will play an important role in treating various diseases.²⁸ Ancient scriptures and other writing have given traditional way for treating the diseases. There is classical health traditional that are followed like, Ayurveda, Unani and Siddha, these have developed from the hostile ancient Vedas, classical text books written by saints and sadhus and other treatises.²⁹ The traditional system of medicine is developed with 2 system functions socially;

- (a) Codified and well organised classical health tradition.
- (b) Diverse and rich oral health tradition and this is not organised and codified.

The oral health traditions that are formed are given by the traditionally trained physicians of village, folk healers, tribes people, and written on the palm leaves.³⁰ The medicinal system of medicine that is originated from India or originated from other places and came into India and encompassed into the Indian culture and tradition are been put up under Indian system of medicine and homeopathy.³¹

The recognised Indian system of are of 5 categories:

1. Ayurveda
2. Unani
3. Siddha
4. Yoga
5. Homeopathy

In this context, there is review of how cancer is treated and managed by alternative system of medicine or Indian system of medicine.³²

Ayurvedic perception of treating and management of cancer:

Origin of Ayurveda: this is a very old and ancient science of life; it is believed that its existence in India for past 5000 years. In world this system of medicine is most recognised. It is a branch of Atharvana Veda.³³ This holistic medicine is acquired by the wisdom and knowledge of great saints and sages and is been succeeded to generations after. The word Ayurveda is derived from the Sanskrit words naming *Ayus* means life and *Veda* means knowledge.³⁴ This system of medicine mainly emphasizes on the healthy living of humans based on maintaining the body balance of the *tridoshas*, *saptadhatu* and *mala*.³⁵

The ayurvedic system of medicine is based on the theory or the hypothesis that all the things in the life is comprised of five basic elements these are called as *panchamahabuthas*:

1. Space (akash), 2. Air (vayu), 3. Prithvi (earth), 4. Water (jal), 5. Fire (agni)

These *panchamahabuthas* are diagnosed in treatment of any disease in the body. The properties of these elements are given below in table:1,^{35,36}

Table 1: Properties of *panchamahabuthas*

Sl.no	Panchamahabuthas	Properties
1.	Akash	This is corresponding to the spaces that is present in the body Ex: abdomen, nostrils, mouth etc.
2.	Vayu	This corresponds to the governing of breathing, movement of eyelids and other motor functions of the body.
3.	Prithvi	It corresponds or represents the solid structures that are present in our body. Ex: teeth, flesh, bones, hair etc.
4.	Jal	This is manifesting the fluids that are present in our body. Ex: saliva, plasma, digestive fluids
5.	Agni	This controls the functioning of the enzymes. Ex: metabolism, digestion etc

These *panchamahabuthas* exist in combination in the human body as *tridoshas* as;

1. *Vata* (akash and vayu), 2. *Pitta* (jal and agni), 3. *Kapha* (prithvi and jal)

These *tridoshas* remain as the three pillars of life. It is in belief that the *tridoshas* are in harmony with each other. But in all the human beings any of this *tridoshas* remain dominant and in that such domination is called as *prakriti* of that particular person. *Tridoshas* prevail in the human body in seven forms and they are called as *saptadhatu*.

1. *Rakta* (blood), 2. *Rasa* (lymph), 3. *Meda* (adipose tissue), 4. *Shukra* (reproductive tissues), 5. *Mamsa* (flesh), 6. *Asthi* (bones), 7. *Majja* (nervine tissues)

These *saptadhatu* are subjected to deterioration or decomposition or wear and tear and hence leading to excretion of the waste material or formation of the excretory material and is called as *Mala*.^{34,36} The *tridoshas*, *saptadhatu* and *mala* are in balance with each other always, if it is in balance then the health condition of humans is good but if these remain imbalanced in the body that leads to pathological condition.^{36,38}

There are 8 major division in Ayurveda as;

1. *Kayachikitsa* (internal medicine), 2. *Kaumar Bhritya* (paediatrics), 3. *Bhootavidya* (psychiatry), 4. *Shalaky* (ophthalmology and otorhinolaryngology), 5. *Shaly* (surgery), 6. *Agada Tantra* (toxicology), 7. *Rasayana* (geriatrics), 8. *Vajakarana* (aphrodisiacs and eugenics)^{33,36}

The treatment that is involved in treating diseases is that, restoring the disturbed balance of the *tridoshas* through maintaining the regularity in the diet, correction of the life-routine and behaviour, usage of drugs to restore that is known as *Panchakarma* (*rasa, guna, vipaka, virya, prabhava*) and rejuvenation therapy known as *Rasayana*.³⁷ Ayurvedic documented treatises are Charaka Samhita, Susrutha Samhita, Kashyapa Samhita, Astanga Hridaya.³⁸

In treating cancer with chemotherapeutic agents is that as the suffer from adverse effects of the drugs. Hence turning back to natural treatment will show no side effects. Cancer treatment with Ayurveda which, moves us back to 7th century BC, where herbal medicines were used in treatment of cancer by the sages Atreya and Dhanwanthari. This system of medicine gives description of cancer as the inflammatory swelling or non-inflammatory swelling and is mentioned as *Arbuda* which is called as major neoplasm and *Granthi* which is called as minor neoplasm.³⁹ As told earlier *prakriti* is that the domination of any one *tridoshas* and there exist seven different types of *prakriti* in combination of *tridoshas* at the time of conception. And this *prakriti* determines the genotype and their individuality. And this genotype remains in balance with the *tridoshas* and inturn to the *dathus*, and imbalance leads to diseases.⁴⁰

When there is disturbance seen in the *tridoshas* that interacts with the *saptadhatu* and causing the weakness of the specific organs that is leading to severe diseases like

cancer that causes effect to the entire body. Ayurveda states that instead of targeting the cancer cells and destructing them and causing the destruction to other cells. Ayurveda mode of treatment is to restore the metabolic defects that is occurred and to restore the normal functioning of the tissues that is called as *sama dhatu parampara*.⁴¹ And also, the immunotherapy for the rejuvenating the body. These forms the base for treating the cancer in ayurvedic perception.^{39,40,41}

As we all know now the reasons for cancer is due to change in life style, epigenetic changes, diet (that regulates *Agni*), environmental factors and changes in the immune system is leading to cancer. therefore, Ayurveda considers these as important factors and restoring the *tridoshas* that is caused in changes due to the above factors.^{40,42} So therefore, abnormalities in the *doshas*, enfeeble *dathus*, changes in the immunity and weakening of the *agni* leads an individual to a condition to cancer and specific type of cancer that is particular to which *dathu* is weakened and changes in the corresponding genotype that is *prakriti*.⁴²

Decoctions are prepared for the herbal drugs where the herbs have anti-cancer property. There are wide variety of medicinal plants which has cytotoxic property and have proved scientifically for its anti-tumor property.⁴³ Example: *Allium sativum*, *Nervilia fordii*, *Rubia cordifolia*, *Piper longum*, *Withania somnifera*, *Annona muricata*, *Cannabis sativum*, *Achyranthus aspera* to name few. Some medicinal plants also possess immunomodulatory effect (that changes the effect of the immune system as the classical chemotherapeutic drugs) examples includes *Tinospora cordifolia*, *Apis mellifera*, *Andrographis paniculate*, *Mafnifera indica* etc.⁴⁴ And also, certain drugs have chemo or radio sensitizing (compounds that makes the tumor cells sensitive to chemotherapy and radiation therapy respectively) effects to kill cancer cells examples include withaferin-A which is obtained from *Withania somnifera*, rohitukine obtained from *Amoora rohituka*, echitamine chloride obtained from the stem bark of *Astonia scholaris* and also berberine obtained from *Tinospora cordifolia*. These three ways can be used in treating cancer.⁴⁵ These immunomodulators and radiosensitizers can be used as adjuvant therapy also with the conventional chemotherapeutic drugs to produce anticancer effect. And this is found to be safe.^{43,44,45}

Advantages of ayurvedic treatment on conventional chemotherapeutic drugs:

1. These are cost effective.
2. It cures the disease from the roots of cancer.
3. It is non-toxic as they do not produce any adverse effects as the chemotherapeutic drugs do.
4. Healthy living of the patients.
5. The treatment regimen remains specific from one person to other according to the imbalance of the body.⁴⁶

Unani perception of treating and management of cancer

Unani system of medicine is called by different names in distinct parts of the universe like Greco--Arab medicine, Oriental medicine, Islamic medicine, Loniah medicine, unani tibb and also as Arabian medicine. This traditional way of healing disease is found in various parts of south Asia.⁴⁷

The complete roots of this system go to the deepest times of a Greek philosopher who is well known for his contribution Hippocrates. A Greek philosopher (384 – 322 BC) Aristotle Galen who is known as the father of the natural history also made a valuable and enormous contribution for this system of medicine.⁴⁸ This system of medicine took its origin from the Greek and moved to Persia that is in Iran and was improved by the Arabian physicians. Hence forth it was called as the Greco-Arab medicine. The Greek knowledge of Unani system was completely translated to Arabic language during the times of political-religious Muslim state began in 632 CE.⁴⁹ The hakims they are the medicine practitioners, relied on the healing of disease based on natural treatment that is the principles of harmony and balance, that is uniting the mental. Physical and spiritual realms.⁵⁰ *Al-Umoor-al-tabiyah* this means the basic physiological principles in Unani system of medicine. According to the hakims human body health is maintained by the harmony between the *Al-Umoor-al-tabiyah*, it consists of seven principles:^{51,52}

1. Arkan, 2. Mizaj, 3. Akhlat, 4. Aaza, 5. Aewah, 6. Quwa, 7. Afaal

These seven physiological principles interact with each other to maintain the balance of human body. In each human being, these constituents have power or self-regulating capacity which is known as *tabiyat* or it's also called as *mudabbira-e-badan* and these constituents remain in equilibrium.

Arkan or the elements are of four non-divisible elements include

- i) Aza (earth), ii) Nar (fire), iii) Hawa (air), iv) Maa (water)

These form the primary components of the body, there are redictable outcomes to actions and the *imtizaj* that is the interactions of the *arkans*. These *arkans* continuously go through changes into various stages of genesis and also lysis, this is because of *ulfat-e-keemiyah* called as accepting the medicine by human body and *nafarat-e-keemiyah* known as rejecting the medicine by human body.

Mizaj, this is the temperaments and essential are: cold, moist, hot and dry. They are in different proportions in human body and is in balanced state. The balance in these *mizaj* determines the *tabiyat* and if imbalance is seen leads the individuals to suffer through disease. It also determines the nature of the disease.

Akhlat they are the humours of the body; Hippocrates proposed these humours of the human body. These

humours were differentiated based on colour. They were reformatted or refined by galen. The humours include;

- i) *Dam* (blood), ii) *Balgham* (phlegm), iii) *Safra* (yellow bile), iv) *Sauda* (black bile)^{52,53}

Each person has their specific humoral makeover, the quantity and quality if these humours and their proportion in proper form maintain the health of the human body. There are six physical factors called as *asbab-e-sittah-zarooriah* and are synchronised with the biological rhythm they are;⁵⁴

- a) *Hawa*: Air, the quality of air which a person breath has head-on effect on human body temperature.
- b) *Makool-wo-mashroob*: The food and the drinks, these determines the tabiyat by the quantity and the quality of the food intake by a person that determines the physical fitness.
- c) *Harkat-wo-sakoon-e-jismaiah*: Exercise done by humans and repose, the physical exercises carried out by a person and emphasizes the internal resistance.
- d) *Harkat-o-sakoon nafsaniah*: Mental work and rest taken by humans, emphasizes the enormous intellectual and emotional activities. And unani states that correct and adequate stimulation of brain and rest as well to it.
- e) *Naum-o-yaqzah*: Sleep and wakefulness, an individual health is maintained if the circadian rhythm is maintained.
- f) *Ihtebas and Istifragh*: Retention and excretion, these are the metabolism and excretion of the food and liquids.

These are the primary factors that Unani practitioners consider that affect the harmony of human body and mind. The secondary factors are called *asbab-e-ghair-zarooriah* that includes the geographical, environmental and socioeconomical factors that influence the *tabiyat*.^{53,54} Various therapeutic approaches in unani system of medicine is that;

- 1) *Ilaj-bi-misla* called as organotherapy
- 2) *Ilaj-bi-dawa* called as pharmacotherapy
- 3) *Tadabeer* called as regimental therapies: this include *dalak* known as massage, *hammam* known as bath and sauna, *hijamat* known as cupping, *fasd* known as venesection, *amat-e-kai* known as leech therapy.
- 4) *Ilaj-bil-yad* known as surgical intervention⁵⁵

Cancer (it's called as *sartan*), this term is derived from a Greek word *crab*, this is because the crab adheres to its prey this is how the cancer adheres to any part of the body. This system of medicine is a holistic approach for the cancer care.⁵⁶ *Sartan* it's the melanotic swelling and type of malignancy that occurs anywhere and in any part of the body. It swells and increases in its size and spreads rapidly. Galen was the person who systematically described about

cancer. he stated that the cancer is due to the excess or increased amount of *sauda* that is black bile which is hard to be diagnosed and identified at the early stages of cancer.⁵⁷ by giving purgatives that is appropriate to remove the black bile which is excess from the body and to adopt different ways to prevent its accumulation in blood vessels. Newly formed cancer cells by the usage of topical anti tumor drugs it has to be removed by *ilaj-bil-yad*. But in case of advanced stages of cancer first purgatives to be given and then the cancer root has to be removed. The blood vessels that is adjacent or next to the cancer cells has to be pressed to remove the thick blood.⁵⁸

In addition to these above treatment foods which is cold in nature and is blood thinning, must be administered to the patient. Body cleansing has to be carried out. If suppose the cancer is near to the vital organs then the process of *ilaj-bil-yad* must not be carried out.⁵⁹ Hence therefore, *hakims* if identifies the cancer in early stages, after the purgative treatment herbal unani medicines are used to halt the progression of cancer. The principle involved in unani system of medicine is utilizing both preventing the cancer and management of cancer. It is done by both substituting with the chemotherapeutic drugs and also as adjuvant with the chemotherapeutic agents.⁵⁷

There are unani herbal formulations that have chemoprotective effect and with diverse pharmacological effects. These unani medicines in combination with the chemotherapeutic drugs as a supportive treatment or therapy to improve the quality of life of the patients suffering with cancer.⁶⁰ Afsantin (*Withania somnifera* (L.) dunal), Aftimun (*Cuscuta reflexa*), Amla (*Embllica officinalis*), Asl-uss-Sus (*Glycyrrhiza glabra* Linn), Baladur (*Seemecarpus anacardium* Linn), Gul-i-Nilofer (*Nymphaea alba* Linn), Inabus-Sa'lab (*solanum nigrum*) to name few as examples of unani drugs.⁶¹ These medicines can be used as adjuvant for management of cancer and it can be used for these purposes;

The quality of life of the cancer patients can be improved. This is done by carrying out *Dalak* which is called as massage therapy, *Shamum* called as the aromatherapy and *Hammam* called balneotherapy. To prevent the occurrence of the side effects or the ADR that seen when usage of chemotherapeutic drugs. For restoring the healthy living by observation of *asbab aitta zarooriyya*.⁶² For enhancing the immunity of the patients suffering with cancer immune modulators are used like;

- 1) Tiryag-e-wabai, 2) Khusta Til Kalan, 3) Khamira Marward

To also reduce the complications that are associated with cancer.⁶³

Siddha perception of treating and management of cancer

This system of medicine has it's originate from South India. It is one of the oldest systems of medicinal practice. It's a combination of ancient medical practice, spiritual disciplines, mysticism and alchemy.⁶⁴ Siddha, it means

achievement. This practice of medicine was gained through practicing yoga and having bhakti by the saints and were called as Siddhars. It is believed that Siddhars and Nandi deva gained this knowledge by Parvathi who passed it over and it was unfolded by lord Shiva to Parvathi.⁶⁵

Siddha system of medicine is from pre-historic or pre-Vedic period. There is no exact evidence when this system of born, but it is told that the development was during the Indus civilization that was between 2500-1700 BC. This was identified and flourished by Dravidians who speak Dravidian language and Tamil is one of its principle. The literature for siddha medicine practice is in Tamil language mostly.⁶⁶ Shangam literature is a treatise containing *Tolkappiyam* and *Tirukural* (contributed by saint Tiruvalluvar). The great saint who contributed to siddha system of medicine was *Agastiyar*. Still his writing is been used as a standard system of medicine for treating diseases.⁶⁷

Astama siddhi these are the eight super natural powers that were possessed by *Siddhars*. These powers may be obtained or attained by birth, or by meditation, or by concentration on the elements.^{64,67} Siddha system of medicine is similar to Ayurveda but some specialization in latro-chemistry. It states that human body is replica of universe. And the body is composed of five elements as that told in Ayurveda or the *panchamahabootham* that is⁶⁸

1. *Nilam* (earth), 2. *Neer* (water), 3. *Thee* (fire), 4. *Kaatru* (air), 5. *Agayam* (space)

The humours that are interacting leading to pathological conditions are called as *Uyir Thathukkal* and remain in ratio of (4:1:1):

1. *Vaatham* (different types are: *Abanan, Piranan, Viyanan, Naagan, Koorman, Kirugaran, Devathathan, Thananjeyan, Samanan, Udhanan*)
2. *Pitham* (different types are: *Anala Pitham, Ranjaga Pitham, Saathaga Pitham, Aalosaga Pitham, Pirasaga Pitham*)
3. *Kapham* (different types are: *Avalambagam, Kilaetham, Pothagam, Tharpagam, Santhigam*)^{67,68}

The humours are present in different forms in the tissue and called as *Udal Thathukkal*. They are:

1. *Saaram*, 2. *Senneer*, 3. *Oon*, 4. *Kozhuppu*, 5. *Enbu*, 6. *Moolai*, 7. *Sukkilam/Suronitham*

The elements, humours and body tissues should remain in balance, imbalance leads to diseased or pathological condition in the body.⁶⁸

Malignant tumours or neoplasm it is called as *Putru* or *Vippuruthi*. In this condition the *Uyir Thathukkal* losses the balance and co-ordination between them and leading to morbidity because the humours are not able to control the proliferation due to the imbalance.⁶⁹ *Siddhar Yugi*, in his book *Yugi vaidhya chinthamani* coined the term *Vippuruthi* and *Dhunmangism* for correlating malignant tumor. Other texts books *Nagamuni nayanavithi, Agathiyar rana*

vaithyam, Agathiyar nayanavithi, these books name cancer as *Putru*. *Yega mooligai prayogam* treatment is available for treating cancer with various herbs like Kodiveli (*Plumbaago indica*), Athimathuram (*Glycyrrhiza galbra*), Kadugurrhogni (*Picrorrhizia kurroa*) etc.⁷¹

The etiology is for cancer may be due these factors large amount of spicy food, excess of meat intake, more amount of minerals, frequently having sexual intercourse with diseased humans (male or female). According to *Anybava vaithya dheva raghasiyam* cancer may be seen in regions like, Uterus (*Karuppai*), stomach (*Iraipai*), liver (*Kalleeral*), bladder (*Vathi*), prostate gland (*Moothira kiranthi*), spleen (*Manneeral*), pancreas (*Kanaiyam*).^{70,74}

As we all know that *Pitham* is responsible for digestion and metabolism in the body cells. But in case of cancer there is imbalance in the elements that is corresponding to imbalance in the humours. There is decrease in *thee*, fire is inversely proportional to *Kapham* that leads to increase in tissue growth. Anabolic growth can be related to *Vatham* and catabolic growth phase can be related to *Kapham* that is causing morbidity. The metabolic crisis is developed in cancer is due to decrease in *thee* and increase in *kapham and pitham*.⁷²

According to this system of medicine, treatment choice is based on the medicinal plant to be used and preparation of medicine with the taste that has to be incorporated and mainly the selection of medicinal plant is based on the humour that is deranged, and there by compensating to reduce or increased the humour are listed in table:2.^{70,72}

Table 2: Taste for medicinal plants to be incorporated for *Uyir Thathukkal*

Sl.no	Humour or Uyir Thathukkal	Taste for the medicinal plant to be incorporated
1.	Decrease <i>pitham</i>	Bitter (<i>Kaippu</i>), sweet (<i>Inippu</i>), astringent (<i>thuvarpu</i>)
2.	Increase <i>vatham</i>	Sweet (<i>inippu</i>), sour (<i>pulipu</i>), salt (<i>Uppu</i>)
3.	Increase <i>kapham</i>	Bitter (<i>kaippu</i>), pungent (<i>karppu</i>), astringent (<i>thuvarpu</i>)

This system of medicine can be used to manage cancer for adjuvant therapy to treat the adverse drug effect.⁷³

1. For pain due to cancer *poondu* can be used.
2. For mental depression and insomnia *brahmi* and *thulasi* can be used.
3. To have effect in treating diarrhoea due to chemotherapeutic drugs *Inji, kirimllikai, vilvam* are used and for constipation *kadukkai* powder is used.

4. For anxiety *manjal, ennchi, kodiveli, thulasi* are better choice of treatment.
5. To gain weight, because of weight loss due to cancer *ammukura* is good choice.

Homeopathy perception of treating and management of cancer.

It was widespread in US, Europe in 1800s. (1755-1843 AD) A German physician Samuel Hahnemann, with this the homeopathy began with the discovery. He coined the term "Homeopathy" (In Greek homoios means *similar*; pathos means *suffering*).⁷⁵

He postulated the "Law of Similars", but this was previously explained by Paracelsus, Hippocrates and was adopted by various cultures like Chinese, Greeks.⁷⁶ But Hahnemann applied this law into medical science. Hahnemann alleged that increased doses of the drugs will exacerbate the illness or the disease. But at the same time if dilutions are done, in minute doses the drugs can produce effect in treating disease. He carried out experiment on himself with small group of population by taking regular and increased doses of *cinchona* this produced symptoms of malaria like fever with less degree of intensity. But the small doses of the same *cinchona* produced cure to the disease.⁷⁷ This made him publish an *Essay on a new Principle for Ascertaining the Curative Power of Drugs* in the year 1796 AD. And also, in the year 1810 AD this work *the Organon of the Healing Art* was published.^{75,77} For this as example, coincidentally Edward Jenner in the year 1798 AD give small doses of cow pox to the people who were affected with chicken pox and immunized them, by this homeopathic treatment gained its popularity.⁷⁸

In this system of medicine, the view on cancer treatment holistically is not clearly explained, but it follows the basic principal of allopathy for treatment of cancer. Drugs are found effective in treatment of cancer by various animal models and *Invitro* studies are given below in table 3;⁷⁹

Table 3: Different drugs prescribed for cancer in homeopathy

Sl.no	Drug	Type of Cancer
1.	<i>Lapis albus</i>	Used for uterine cancer
2.	<i>Calcarea flour</i>	Used in treating breast cancer
3.	<i>Chelidonium</i>	Showed anti-cancer property on hepatocarcinoma
4.	<i>Thuja</i>	Showed effect against melanoma cell lines
5.	Ruta 200c	Showed effective in sarcoma
6.	<i>Viscum serrulata</i>	Effective against pancreatic cancer
7.	<i>Sabal serrulata</i>	Shown effective against prostate cancer

Homeopathy can also be used as adjuvant therapy in palliative care in treating cancer with chemotherapy and radiotherapy.⁸⁰

Lycopodium 30c, this drug can be used in treating rectal bleeding due to administration of chemotherapeutic drugs.

Thuja and *Lycopodium* used in combination relieved the symptoms like oedema, loss in appetite.

After carrying out radiotherapy in cancer patients *cobaltum* 30 was administered to the patients maintained the quality of life of the patients.

Calendula, this drug was administered after carrying out radiotherapy and was effective in treating dermatitis that was caused due to radiotherapy and was more effective than trolamine.

Drug named *Traumeel S* which is a polydrug combination, relieved the pain that was caused due to cancer and effective in treating stomatitis that was caused due to chemotherapeutic drugs.

Homeopathic drugs can be used in treatment and as adjuvant in treating cancer and maintaining quality of life, but the exact mechanism of action of how the drugs are able to treat cancer is not explained clearly and studies are still on going in identifying the use of homeopathy in cancer.

ROLE OF YOGA IN CANCER MANAGEMENT

This is a holistic approach that is used in maintaining the quality of life, reducing the symptoms, reduction in stress, improving the mood changes that is occurring in the cancer patients to increase the survival time.⁸¹ Cancer always proves a psychological stress in patients with physical distress. The treatment regimens that are used in treating cancer with chemotherapeutic drugs provides various adverse effects in patients like vomiting, nausea, pain, alopecia, sexual dysfunction, infertility etc which ultimately affects the quality of life and living of the cancer patients.⁸² Psychosocial, psychoeducational intercessions as adjuvant treatment for cancer patients which will increase the self-esteem which will enhance the psychological status and to fight against cancer.⁸³

This is an ancient practice and has its own physical and mental benefits in early days. Now a day's yoga has gained its popularity globally and before it was only seen in India for centuries. When we look into spiritual dimension, it is a path to attain the superconscious state beyond the knowledge and perception. It deals with moral, mental, physical and spiritual well-being of humans.⁸⁴ Yoga Sutras this was a treatise of 900 BC of Patanjali, in this yoga is defined as *citta vritti nirodhah* which means that the yoga is a practice of controlling mind by eight-fold path known as *Astanga Yoga*. They include⁸⁵

1. Niyamas, 2. Yama's, 3. Asanas, 4. Pranayama, 5. Dharana, 6. Pratyahara, 7. Dhyana, 8. Samadhi

Yama, niyama, asana, pranayama is used widely for maintaining both physical and mental status of the



individual suffering with cancer. There are some yoga techniques in managing the cancer related symptoms:⁸⁶

- ❖ **Trikonasana:** this yoga practice can relieve symptoms like fatigue, stress, myofascial pain (upper and lower extremity), headache and also in post-surgery pain.



Figure 1: Trikonasana

- ❖ **Pavanamuktasana:** this practice is used in constipation, myofascial pain of lower extremities pre and post-surgery pain and in headache.



Figure 2: Pavanamuktasana

- ❖ **Sethubandasana:** this is used in constipation and myofascial pain of lower extremity.

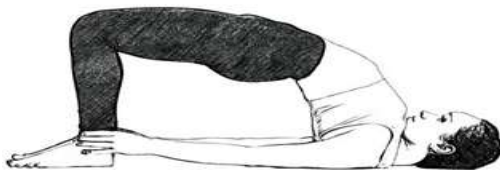


Figure 3: Sethubandasana

- ❖ **Bhujangasana, Pranayama, Ardhasalabhasana, Ardhakatichakrasana:** this practice is used in fatigue, chemotherapy induced nausea and vomiting, constipation, head and pain, stress and in pre and post operation pain.



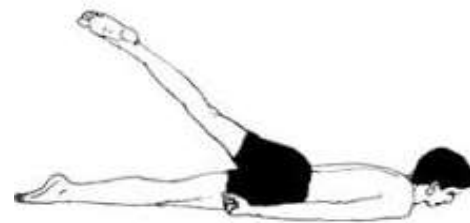
Bhujangasana



Pranayama



Ardhasalabhasana



Ardhakatichakrasana

Figure 4: Bhujangasana, Pranayama, Ardhasalabhasana, Ardhakatichakrasana

- ❖ **Padahastasana:** this is used in fatigue, constipation, stress, myofascial pain in upper extremities, headache and pre and post-surgery.



Figure 5: Padahastasana

- ❖ **Kapalabhati, Ujjayi pranayama, Bhramari pranayama:** this is used in mood swings, anxiety, depression, sleeplessness and psychological distress this is contributing to antidepressant and anxiolytic effect.



Kapalabhati



Ujjayi pranayama



Bhramari pranayama

Figure 6: Kapalabhati, Ujjayi pranayama, Bhramari pranayama

CONCLUSION

Cancer is the condition where there is abnormal cell division and differentiation leading to death. Hence treating and management of this deadly disease is important due to the life style modification that is occurring in this generation. There are various chemotherapeutic medication, radiotherapy and surgical therapies are available for treating cancer. But the main disadvantage is the occurring of life-threatening adverse effects. To overcome such adverse effects switching to alternative system of medicine can be a better treatment choice. The alternative system of medicine view on cancer and its treatment towards cancer with adjuvant therapy is reviewed.

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