Editorial

Cancer Care- A Scenario in tertiary Rural Institute of Bangladesh

What is Cancer?

Cancer is a class of diseases characterized by uncontrolled growth of abnormal cells anywhere in a body. The abnormal cells are termed cancer cells, malignant cells, or tumor cells.

Many cancers and the abnormal cells that compose the cancer tissue are further identified by the name of the tissue that the abnormal cells originated from (for example, breast cancer, lung cancer, colon cancer).
Cancer is not confined to humans; animals and other living organisms can get cancer.

Cancer may affect people of all ages, but risk tends to increase with age. It is one of the principal causes of death in developed countries.

Today, the Greek term carcinoma is the medical term for a malignant tumor derived from epithelial cells. It is Celsius from Latin meaning word oncology.

Cancer knows no boundaries. It not only affects the quality of life of the person living with the disease but also adversely impacts the psychosocial welfare of entire families. Its effects can be wide-ranging and a downward spiral wave can result in broad economic implications.

What Causes Cancer?

Programmed cell death is called apoptosis, and when this process breaks down, cancer begins to form. Unlike regular cells, cancer cells do not experience programmatic death and instead continue to grow and divide. This leads to a mass of abnormal cells that grows out of control.

Genes - the DNA type

Cells can experience uncontrolled growth if there are damages or mutations to DNA, and therefore, damage to the genes involved in cell division. Four key types of gene are responsible for the cell division process: oncogenes tell cells when to divide, tumor suppressor genes tell cells when not to divide, suicide genes control apoptosis and tell the cell to kill itself if something goes wrong, and DNA-repair genes instruct a cell to repair damaged DNA.

Carcinogens

Carcinogens are a class of substances that are directly responsible for damaging DNA, promoting or aiding cancer. Tobacco, asbestos, arsenic, radiation such as gamma and x-rays, the sun, and compounds in car exhaust fumes are all examples of carcinogens. When our bodies are exposed to carcinogens, free radicals are formed that try to steal electrons from other molecules in the body. Theses free radicals damage cells and affect their ability to function normally.

Genes - the family type

Cancer can be the result of a genetic predisposition that is inherited from family members. Certain genetic mutations or a fault in a gene that makes one statistically more likely to develop cancer later in life

Other medical factors

As we age, there is an increase in the number of possible cancer-causing mutations in our DNA. This makes age an important risk factor for cancer.

What are the sign and symptoms of cancer?

- Loss of appetite and gradual weight loss
- Continued fever
- Hoarseness of voice for a long time
- Chronic cough not cured by antibiotic treatment
- Any swelling in the body
- Lump in breast
- Per vaginal bleeding

- Per rectal bleeding
- Change of bowel habit
- Skin pigmentations
- Chronic ulcers
- Bleeding disorders
- Anemia etc.

How is cancer classified?

There are five broad groups that are used to classify cancer.

1. Carcinomas are characterized by cells that cover internal and external parts of the body such as lung, breast, and colon cancer.
2. Sarcomas are characterized by cells that are located in bone, cartilage, fat, connective tissue, muscle, and other supportive tissues.
3. Lymphomas are cancers that begin in the lymph nodes and immune system tissues.
4. Leukaemias are cancers that begin in the bone marrow and often accumulate in the bloodstream.
5. Adenomas are cancers that arise in the thyroid, the pituitary gland, the adrenal gland, and other glandular tissues.

How is cancer diagnosed and staged?

Imaging techniques such as X-rays, CT scans, MRI scans, PET scans, and ultrasound scans and endoscopic biopsy with histopathology and cytology. Tumour markers are used regularly in order to detect where a tumor is located and what organs may be affected by it.

How is cancer treated?

Cancer treatment depends on the type of cancer, the stage of the cancer (how much it has spread), age, health status, and additional personal characteristics.

There is no single treatment for cancer, and patients often receive a combination of therapies and palliative care.

Treatments usually fall into one of the following categories: surgery, radiation, chemotherapy, immunotherapy, hormone therapy, or gene therapy.

Surgery

Surgery is the oldest known treatment for cancer. If a cancer has not metastasized, it is possible to completely cure a patient by surgically removing the cancer from the body.

Radiation

Radiation treatment, also known as radiotherapy, destroys cancer by focusing high-energy rays on the cancer cells. This causes damage to the molecules that make up the cancer cells and leads them to commit suicide. Radiotherapy utilizes high-energy gamma-rays that are emitted from metals such as radium or high-energy x-rays that are created in a special machine.

Chemotherapy

Chemotherapy utilizes chemicals that interfere with the cell division process - damaging proteins or DNA - so that cancer cells will commit suicide. These treatments target any rapidly dividing cells (not necessarily just cancer cells), but normal cells usually can recover from any chemical-induced damage while cancer cells cannot. Chemotherapy is generally used to treat cancer that has spread or metastasized because the medicines travel throughout the entire body.

Immunotherapy

Immunotherapy aims to get the body's immune system to fight the tumor. Local immunotherapy injects a treatment into an affected area.

Hormone therapy

Several cancers have been linked to some types of hormones, most notably breast and prostate cancer. Hormone therapy is designed to alter hormone production in the body so that cancer cells stop growing or are killed completely.

Gene therapy

The goal of gene therapy is to replace damaged genes with ones that work to address a root cause of cancer: damage to DNA.

Cancers that are closely linked to certain behaviors are the easiest to prevent.

- Maintain personal hygiene
- Avoid tobacco
- Take high fiber diet
- Avoid fatty diets
- Take green leafy vegetables
- Regular screening for breast and cervical cancers at appropriate age
- Take early step.

Khwaja Yunus Ali Medical College Hospital (KYAMCH)- cancer center scenario

In this scenario, Khwaja Yunus Ali Medical College and Hospital Cancer Center started their mission to treat the cancer patients with this modern concept by establishing department of Medical and Radiation oncology separately.

At present it has separate Medical and Radiation oncology department.

Medical oncology department has the facilities like :

- OPD (outpatient department) service at minimal fees.
- IPD(inpatient department) dealing with administration of chemotherapy and management of chemotherapy induced complications.
- For administration of chemotherapy infusion pump for each and every patient is available and syringe pump for supportive management of cancer patient. For this entire thing they have AC ward at a very nominal price.
- They have separate isolation room for patients suffering from neutropenic sepsis (as a result of chemotherapy) to prevent cross infection.
- They have minor procedure room and separate chemotherapy drug mixing room.

All these services are delivered by their trained doctors and oncology nurses under the active guidance and direct supervision by experienced oncologist from home and abroad.

They have started administration of chemotherapy by putting central venous access for both adult and pediatric patients. Cost of these services are very minimum in comparison to other center throughout the world.

Cancer Center has separate radiation oncology department having the facilities like :

- Two dedicated CT scanner for acquisition of images needed for simulation.
- Computerized TPS(treatment planning system).
- They do periodic calibration with water phantom once in a month and daily QA (quality assurance) check.
- They are using all the accessories like breast board, thermoplastic musk, vaclock etc for immobilization of patient during treatment.
- They are using two duel energy Linear Accelerator with multileaf collimator(MLC) and other accessories for the first time in Bangladesh. For photon it has option to run by 6 and 15 MV and for electron beam 4, 6, 8, 15 and 18 MeV of energy. The advantage of the MLC is that they can conform the beam as per shape of the tumour which is not possible with Co 60 machine in our country right now. There is an image acquisition system, EPID (Electronic portal imaging device)for verification of patient position during treatment time. So, radiotherapy can be delivered very precisely to the tumour volume without causing so much harm to normal tissue, as because radiotherapy destroys normal and cancerous tissue. The goal of modern radiotherapy techniques is to deliver proper radiation dose to tumour and very minimum to normal tissue. This can be achieved only by linear accelerator with MLC.
- They also have one HDR(High Dose Rate) Brachytherapy unit with CT based computerized treatment planning system.
- With all these equipment they are providing HDR Brachytherapy, 3D-CRT(three-dimensional conformal radiotherapy), IMRT(Intensity Modulated Radiotherapy), IGRT (Image Guided Radiotherapy) for the first time in Bangladesh.
- Their LINAC is compatible with the option of SRS (Stereo-tactic Radio-Surgery), SRT (Stereo-tactic Radiotherapy), SBRT(Stereo-tactic Body Radiotherapy).

- Cost of radiation therapy is cheaper than any other comparable center in the world.
- They have separate department of medical physics, which is very fundamental back up for a radiotherapy center.
- Trained medical physicists are doing treatment planning and quality assurance.
- Full-time trained engineers are supporting them for regular maintenance.

All together, they have established the center as a center of excellence at affordable price to treat the cancer patients.

The numbers of well-trained oncologists are very few and beds now available in both public and private hospitals and clinics are only 45,156 or one bed for 2778 persons on an average. With regard to cancer, the situation is even more precarious. Against an estimated number of 800,000 people suffering from various types of cancer, the existing facilities can provide treatment to only 10-15,000. 200,000 new cases are being added every year. In the absence of adequate number of well-trained cancer specialists & modern facilities for cancer treatment in the country, patients from financially well off families often go abroad for treatment. However, many of the others are suffering and dying almost unnoticed. So the fight against cancer is prime mission of Kyamch Cancer Center. In close partnership with patients and national & International cancer societies, Kyamch Cancer Center is in a unique position to pool resources and expertise to contain the further spread of this deadly disease. Now they are beginning to hope that the kyamch Cancer Center will reverse this trend. The objective of kyamch Cancer Center is not only to serve cancer patients through creation of modern treatment facilities but also to make people aware of the benefits of preventive measures. Preventing cancer is not a single time job rather it is a continuous journey. Kyamch Cancer Center is dedicated to continue this journey for a long time. Time will come when country will feel proud that Bangladesh has a cancer hospital like Kyamch Cancer Center.

Future recommendations

For the great benefit of the cancer patients we have to have more qualified, well trained man power (Oncologist, Physicist, Technicians) and modern facilities to treat cancer in government and non-government sectors. At the same time we have to make awareness about cancer in general population by celebrating different programs and with all these efforts we will be able to give better services to the cancer patients as well as to the survivors.

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