

Questions and Answers About Cancer

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What is cancer? How is it caused? Tell me something about it.

Cancer is a group of many different diseases that have some important things in common. Cancer affects our cells, the body's basic unit of life. Cancerous cell is larger in size than normal cell, multiplies uncontrollably, spreads to other organs and is independent of the normal regulations of the body. To understand more about cancer, it is helpful to know how normal cells become cancerous. In short it can be said that alteration or loss of good genes and development of many bad genes results in cancer.

The body is made up of many types of cells, which live under well-regulated conditions. Most of the functions of the cell are carried out under the orders of "genes", which are DNA particles inside the nucleus of the cell. Some of the important functions of the cell are - multiplication, growth and repair and these are carried out under control of regulatory "genes". These genes ensure that the required function is carried out only when required and stops when not required, something like 'on' and 'off' buttons. They also ensure that the normal cells do not encroach on other organs and respect cellular boundaries. For example, when there is an injury of any part of the body, the damaged tissues send a signal to the cells in the neighbourhood (the button is on!) and the cells start multiplying and on completion of healing the signals are sent again (the button is off!) and the cells stop multiplying.

When there is an alteration (mutation) of these regulatory genes, the cells behave in a different manner and when many such abnormal mutant genes (oncogenes) accumulate in the cell over the period of time, the end result is cancerous growth. The situation is like having wrong buttons on and right buttons off. The cells grow in size and number; multiply uncontrollably without any purpose. They spread to other organs and start growing there too. During their growth they can destroy the organs, impair their functions, steal the nutrition, produce many harmful substances that can lead to wasting of the body and ultimately death. This is the cancer that troubles the

patient.

Cells can become cancerous if some important regulatory genes are lost completely from the cell. Other genes undergo mutations without any check (like the bad guys being active in absence of policemen) and form 'oncogenes' and the end result is the cancerous growth. Thus one can conclude that these regulatory genes when present normally have eliminate the mutations occurring in the body before they can cause any harm. Since these genes can prevent cancer they are appropriately referred to as 'tumour suppressor genes'. Many such genes exist in the body and their loss results in specific cancers. They may be responsible for familial cancers, as well as faster growth in some cancers, and thus believed be very important in the genesis of cancer. It is possible that such genes prevent cancerous growth in many of those heavy smokers who do not suffer cancer.

So cancer is the end result of many genetic events as multiple mutations and loss of tumour suppressor genes.

What causes cancer?

The formation of cancer cell (carcinogenesis) is the end result of a long complicated process and multiple genetic events. Unlike infections, it may take long time, upto few years in some cancers to develop. What brings about the change in the genes (mutations) in the cell is not fully known. Some of the factors are inheritance of wrong genes, loss of tumour suppressor genes, exposure to radiation, tobacco use, viral infections, wrong dietary habits, dietary chemicals, use of alcohol, lack of exercise, obesity, hormones etc. In some cancers nulliparity is a predisposing factor, while in others sexual promiscuity, multiple sexual partners and multiparity are responsible. Long-term exposure to these factors leads to mutations and then the cancer. It has been well documented that incidence of cancer in the country has been on the increase during the process of industrialisation due to changed life-styles and exposure to many known factors. After many years the incidence of cancer comes down on implementation of well-planned cancer control programmes.

What is a tumour? And what are benign and malignant tumours?

When the mass of extra cells grows to a visible size is referred to as 'tumour'. Tumours can be benign or malignant. Benign tumours are not cancer. They often can be removed and, in most cases, they do not come back. Cells in benign tumours do not spread to other parts of the body. Most important, benign tumours are rarely a threat to life. Apart from removal they do not require any other form of treatment.

Malignant tumours are cancerous growth that we have been talking about. Cells in malignant tumours are abnormal and divide without control or order. These cancer cells can invade and destroy the tissue around them. Cancer cells can also break away from the original site of a malignant tumour and enter the bloodstream or lymphatic system vessels (the two systems of vessels that bathe and feed all of the body's organs). This process, called 'metastasis', is how cancer spreads from the original tumour to form new tumours in other parts of the body. This spread determines the

'stage' of cancer. An advanced stage refers to when the spread is to distant organs and early stage means the spread has not taken place.

I have not smoked, but why did I get Cancer?

It is natural to ask this question. In some, we can conclude about the cause like tobacco etc as mentioned earlier. In others, without any such obvious cause, some unknown factors operate especially to do with genes. It is possible that one may have inherited or acquired some bad genes. Or may have lost some tumour suppressor genes. Many mutations occur in the cells everyday when millions of cells are formed but natural processes involving tumour suppressor genes and immune cells eliminate most of them before they can cause any damage. In patients of cancer such processes are impaired and result in cancer.

Natural History of cancer

On exposure to a causative agent over a long period, the cell undergoes mutations (initiated cell). While retaining its normal appearance it differs only in the genes. On continued exposure to the offending agent, more genes accumulate and the cell starts looking and behaving different. It becomes independent (autonomous) and multiplies uncontrollably, while acquiring more oncogenes.

When the number of cells becomes about 10^8 (thousand million) after twenty cell doublings, the tumour measures one centimetre, weighs about one gram and is the earliest tumour that can be detected. By now the cancer has spent about half of its life cycle in the body. During this initial stage itself, invisible spread to other organs would have taken place in a majority of the cancers. The spread occurs through local extension, lymph nodes and blood stream. Over the period of time, these invisible cells grow into obvious tumours and are referred as 'metastases'.

The cancer cells steal away the nutrients from the body, making a person weak; damage the organs in the vicinity leading to the signs and symptoms. In addition they secrete several substances with harmful effects. Death occurs when it assumes a critical mass.

What are the common signs and symptoms of cancer?

The symptoms of cancer are not specific to cancer only but can occur due to any disease. However if any of the symptoms persist the chances of cancer are high. These are some of them:

1. **C**hange in bowel or bladder habits,
2. **A** sore that does not heal,
3. **U**nusual bleeding or discharge,
4. **T**hickening or lump in the breast or any other part of the body,
5. **I**ndigestion or difficulty swallowing,
6. **O**bvious change in a wart or mole,
7. **N**agging cough or hoarseness.

It is important to see a doctor if one has any of these symptoms for prolonged time or they progress rapidly. Most cancers in the initial stages are painless. Development of pain is indicative of an advanced cancer.

How is cancer diagnosed?

For confirmation of cancer it is essential to establish a histological diagnosis, that is a pathologist has to see the cancerous cells from the tissue of the tumour, under the microscope. To obtain the tissue, several tests are performed that include fine needle aspiration cytology (FNAC), core biopsy, as well as open biopsy.

By FNAC he takes out few cells from the tumour or a node through a fine needle attached to a syringe. Fine-needle aspiration biopsy is a very accurate test as long as enough material is obtained, but it is not always easy to get a good sample. If the sample is not good enough, the test may need to be repeated or further tissue is removed by a biopsy or surgery. A fine-needle aspiration biopsy is will be painful, as it is done without local anaesthesia. But any pain does not last for more than a few seconds. It is not possible to get cells by FNAC in every patient hence a negative report does not exclude cancer.

A core biopsy is similar to a fine-needle aspiration biopsy, but larger needle is used to remove a thin core of tissue under local anaesthesia, which makes it a painless procedure. This test gives him a clue to the diagnosis.

If a definite diagnosis has not been made by either fine-needle aspiration or core biopsy, it may be necessary to have an open biopsy. This is an operation designed to get an adequate sample of the lump for the pathologist to examine. An open biopsy can be done under either local anaesthetic or general anaesthetic. An open biopsy is the most reliable way to know whether the growth is cancer.

In leukaemia the blood and the bone marrow smears are examined to confirm the diagnosis. Sometimes the diagnosis is made after the removal of an organ for a different purpose, such as an infection or a benign growth. In some deep-seated tumours, help of the CT or MRI scans is taken to reach them for a biopsy. In few types of cancers a blood test for a particular substance (tumour marker) secreted by tumour is sufficient to diagnose.

Doctors talk about the stage. What does the 'Stage' mean?

The extent of the tumour, its spread to lymph nodes, neighbouring and distant organs determines the stage of the disease. There is an internationally accepted system of staging (UICC –TNM) of the disease. Usually there are four stages of the disease.

- Stage I -the cancer is limited to the organ of origin.
- Stage II -spread to local lymph nodes.
- Stage III -large tumour that has spread to neighbouring organs and or nodes.
- Stage IV -spread to distant organs.

Some of the cancers have a different staging system and are denoted as A, B, C and D. By and large the interpretation remains unchanged.

On confirmation of the diagnosis, the doctor examines the patient thoroughly to detect any abnormality and thereafter orders for several tests such as CT scans, MRI, Ultrasound, Bone scans of various parts of the body to determine the stage of the disease. (Staging investigations). Tumour markers for some diseases are helpful to monitor the disease.

How is cancer treated?

Present strategy of cancer treatment is to remove the tumour and or kill the cancer cells. To cure a cancer it is necessary to completely eliminate the cells at the site of origin as well as the metastases whether occult or obvious. Otherwise the remaining cells will grow into a tumour all over again. Newer strategies are under research with an aim of converting them into normal cells, or undo the genetic changes.

Currently available methods are surgery, radiation therapy, chemotherapy, hormone therapy and biological therapy. Surgery, and radiotherapy take care of local (site of the tumour) and regional (nodes) disease, whereas chemotherapy, hormonal and biological treatment handle the systemic disease (cancer spread to all the organs). The oncologist may use one or a combination of methods depending on the type and location of the cancer, stage of the disease, the patient's age and general health, and several other factors. To achieve a cure, usually more than one modality is required hence the oncologists refer to multi-modal approach to treat cancer.

Surgery: By surgery, the tumour is removed in its visible entirety with some normal surroundings. It is essential to remove a lot of surrounding normal tissue, which may have the microscopic spread, to ensure cure. In small tumours (stage I or II), such surgery may be sufficient to cure, but in large tumours it is surely not enough. Some cells would remain nearby as well as in the rest of the body. Though it may appear that the tumour has been removed fully, most of these grow either at the same place or at different places. Hence it is mandatory to treat them with additional treatment.

The surgery always not carried out for cures, but also for palliation such as to relieve the obstruction of intestines, bile tract and so on. It may also be a diagnostic one

when there is a mass deep-seated in abdomen or elsewhere.

Radiotherapy: Radiotherapy involves the use of radiation to damage or kill cancer cells at the site of delivery. The radiation is delivered through highly sophisticated machine placed at a distance (Tele-radiotherapy) or the source is kept in the tumour or in a body cavity (brachytherapy). It can be the sole treatment or can be used in addition to surgery or chemotherapy in many possible sequences.

In small tumours that are extremely sensitive to radiation, radiotherapy alone may be curative. In large tumours it is used after the surgery, to kill the residual microscopic cells in the remaining tissue or organ. Sometimes it can be given before the surgery in order to shrink the tumour size to make it operable. It is also used to relieve the severe pain due to a large tumour or metastasis or bleeding from the tumour. Of late it has been used along with chemotherapy to enhance each other's effect and have a better cure rates.

Chemotherapy: Cancer chemotherapy is the use of chemical agents with ability to kill cancer (anticancer drugs) to treat cancer. These drugs on administration circulate through the blood to most parts of the body and kill the cancer cells. More will be discussed about chemotherapy subsequently.

Hormonal therapy is another form of systemic therapy that involves administration of anti-hormones or hormones, effective in hormone dependent cancers, such as breast cancer, prostate cancer or endometrial cancer.

Biological therapy uses some kind of an agent derived from body itself, and takes care of the cancer cells in some cancers, after the main treatment is completed. Examples are such as Interferon, Levamisole, IL2 etc.

What treatment will I get?

The treatment decision is taken after taking into consideration the type of cancer, its stage, curative potential of the tumour, status of patient's general condition and his systems. There may other factors like age, patient's intent and motivation of the patient and is willingness to undergo the treatment. After all the considerations, the team of oncologists can suggest a plan of treatment, sequence specifying the intent. Intent of treatment may be curative or palliative. The patient may have to exercise the option of treatment. General principles followed are mentioned.

Local Disease: When the tumour is confined to the organ, removal of the tumour by surgery or local radiotherapy depending on the type of tumour will be the right choice. It may or may not be followed by systemic therapy.

Loco-regional Disease: Patient may be offered surgery followed by radiotherapy for local and regional disease and systemic treatment to cover the micro-metastasis.

Locally advanced Disease: Since the tumour is likely to be too big for surgery, initial chemotherapy or radiotherapy may be offered to decrease the tumour to an

operable size and it can be followed by surgery. Follow up treatment with systemic therapy and radiotherapy if not given earlier become mandatory.

Disseminated Disease: Systemic treatment will be the obvious choice due to widespread disease as the surgery and radiotherapy will not be able to take care of the tumour.

Though the above plan appears too simple, there would be some exceptions. Moreover, many factors will be considered before the final decision is taken, such as patients' age, general condition, his physical capacity and willingness to tolerate the treatment. For example an old patient and a young patient with same disease may be offered different treatment options. Simply because in the old patient there may be limitations due to associated ailments; his systems may not be functioning at their peak and may be adversely affected with treatment; he may not be willing for a prolonged treatment and so on. It may not be true if the same old man is healthy and all his systems are functioning well and he is willing to undergo the treatment.

Sometimes we have to consider whether the patient would benefit at all with treatment. Such situations are when natural history of the disease is slow and harmless; or if the patient is too sick and treatment side effects would be detrimental to his health; or if the cancer is too resistant to treatment offered.

Thus treatment would vary from patient to patient, disease to disease and stage to stage. Many factors determine the treatment in a given patient. Involvement of patients and their families in treatment decision is very vital. As they must understand the intent of treatment, side effects, limitations, curability, pros and cons of each treatment options.

Why should I decide my treatment? Doctor should decide what is best for me!

In cancer treatment the decisions are based on various factors on of them being patients' wishes. For example, the options are between removal of whole breast and only a part of it. It has to be decided by her if she wants to retain her part of her breast or totally remove it. Similarly, an old man may wish to have no treatment, as he is not troubled by cancer so much. His family may wish otherwise. The decision to have or not to have treatment will have be decided by him. Many such situations arise during the management, which require 'informed decisions'.

Cancer treatment is quite different from all other diseases. Firstly, the side effects of treatment are considerable, sometimes more troublesome than the disease though but most are reversible after treatment. Secondly, the responses are unpredictable. One cannot predict the response in a given patient. Thirdly, treatment and follow up take a long time. So the patient and his family will have to have a lot of patience to undergo treatment and see the results. Fourthly all patients do not have curable disease. Hence

the treatment intent would be different and so the intensity of treatment. It may be difficult to accept for some while some accept gracefully. Fifthly, all patients do not have the same goal in life. While some may consider quality of life as their goal, for some it is important to have extended life at some small price and risk if required. And the last but not the least of all, pre-existing ailments like heart, liver, kidney or lung diseases will have an impact on the treatment plan.

So most important is that patient should take active part in treatment decision rather than submitting to the doctor "do what you think is best".

I have just been told that I have cancer. Should I undergo treatment immediately or can I wait for few days to decide?

It is quite okay if you wait for few days to decide. With some exceptions, cancer surgery or treatment is not so urgent and safely wait for few days. The situations where there is a necessity of immediate treatment are acute leukaemia, tumours affecting the various organs and threaten life, limb, spinal cord involvement and brain involvement.

I just went for a test, after more of them, doctors tell me that I have cancer. I don't feel anything and why I should I go for treatment?

Well, this is a consequence of our medical progress, that the tumour has been detected during the tests such as X-ray, Ultrasound, CT Scan or other imaging technique, before it has become big enough to cause symptoms. Depending on the tumour type, size, site, stage and other factors the oncologist would recommend the treatment options. Before such decisions one has to consider the natural history of cancer, likely response to treatment, side effects and overall effect on survival and quality of life. Patient's participation in decision becomes very important, as he does not have any symptoms.

Is my cancer curable?

The term 'cure' means that the patient will live for his expected life span on completion of treatment. This must not be confused with a term 'response' that doctors use, which means the reduction in size of a tumour with chemotherapy or radiotherapy. If the tumour disappears completely it is called a 'complete response' (CR) and when it reduces by at least fifty percent of its original size it is referred to as 'partial response' (PR). To achieve a cure it is essential to have a complete response but all patients with CR may not be cured. That is because some cells obviously remain in the body and they regrow over period of time.

With currently available methods, approximately forty percent of cancers are curable, while in thirty percent a meaningful result with extension of some quantity and

quality of life can be achieved. In rest, only a palliative treatment with sole aim of improving the quality of life can be offered.

There are some factors which determine the curability of the cancer such as the rapidity with which they grow, stage of the disease, sensitivity to chemotherapy and radiotherapy, natural history of the disease, presence or absence of some genes and so on.

Some of the cancers despite being in advance stages do not threaten life and even with such tumours the patients can live for their normal life span. Some cancers like acute leukaemia can be fatal if untreated within few weeks. Majority of the cancers belong to the intermediate group. Some tumours are very responsive (sensitive) to chemotherapy and radiotherapy hence the chances of cure are high while some are resistant to them and the chances of cure become negligible in such cases.

So in a given patient, all these factors determine the chances of cure or what the doctors refer to as 'prognosis'. With available statistics based on the world's experience, one can predict the chances of cure in a particular cancer with reasonable accuracy. This can immensely help to identify potentially curable patient and plan the treatment.

Who should treat me?

Since cancer treatment consists of multiple modalities, a team of specialists should treating you jointly rather than one single specialist. A team effort and management is an inescapable requirement today. Depending on the disease and the treatment planned different oncologists will be managing you at a time. It is very important that well-trained and experienced oncologists must treat. Surgical oncologist performs surgery, radiation oncologist plans radiotherapy, and medical oncologist plans systemic therapy. There are specially trained ENT specialists and gynaecologists trained to treat respective patients.

I am told I have cancer but may not require treatment. Is it possible that I can live without treatment?

A considered decision of not treating cancer is taken under certain circumstances. Firstly, when natural history of the disease does not harm the patient and allows him have a good quality of life with normal life span. Secondly, when the disease is resistant to available treatment options and with no benefit of treatment. Thirdly, when the treatment option is likely to be highly toxic due to systemic damage with great impact on quality of life and lastly when patient is unwilling for treatment.

Such decisions are taken only after complete discussions with the patient. All patients are advised to discuss the benefits and side effects of treatment.

Will my Cancer spread to my family members?

No. Cancer is a non-communicable disease. It cannot spread from one person to other person, like an infection does. So a cancer patient can be kept safely at home without any harm to other family members. Rather he requires the family support more than at any other time.

Will my family members get cancer later? Are we a cancer family?

No.

What are clinical trials about?

Since the medical science has at present limited knowledge of the treatment of cancer, a lot of research is going on to determine the newer methods as well optimal method of using the currently available methods. Through research, doctors learn new ways to treat cancer that may be more effective than the currently available therapy. In some studies, all patients receive the new treatment. In others, doctors compare different therapies by giving the new treatment to one group of patients and the standard therapy to another group. Research like this has led to significant advances in the treatment of cancer. People who take part in these studies have the first chance to benefit from treatments that have shown promise. They also make an important contribution to medical science. Such trials have been and will continue to guide the doctors to treat the cancer in a better fashion. As the trials cannot be carried without the patients, it is important for the patients to cooperate in the trials conducted by the doctors. An important option for people with cancer is to take part in clinical trials. Doctors conduct clinical trials to learn about the effectiveness and side effects of new treatments.

Can cancer be prevented?

As we are aware now that cancer develops gradually as a result of a complex mix of factors related to environment, lifestyle, and heredity, we can conclude that avoidance of the known factors will prevent cancer.

Avoidance of tobacco products, harmful rays of the sun, and choosing foods with less fat and more fibre can prevent many cases of cancer. In addition, alcohol and exposure to certain chemicals and/or radiation may increase a person's risk of developing cancer. Though many risk factors can be avoided, others such as inherited factors are unavoidable. It is helpful to be aware of them, but it is also important to keep in mind that not everyone with a particular risk factor for cancer actually gets the disease; in fact, most do not. People who have an increased likelihood of getting cancer can help protect themselves by avoiding risk factors where possible and by getting regular checkups so that, if cancer develops, it is likely to be found early. Treatment is likely to be more effective when cancer is detected early.

Where Should I get my treatment?

Without any doubt it has to be carried out at an oncology centre with all facilities of chemotherapy, radiotherapy, oncosurgery etc. Earlier very few such centres existed in the country but now several such centres exist. So one does not have to go far from his place of residence to reach an oncology centre.

{Cancer treatment was once upon a time was done in a few places. Now it is carried out at several places in our country. What you should ensure that the diagnosis is correct. One must consult the specialists in the field. The cancer specialists now are many. Surgical oncologist carries out the surgery, radiation oncologist administers radiotherapy and medical oncologist administers chemotherapy, while the tissue diagnosis is carried out by the onco-pathologist. There may be more specialists as head and neck oncologists, gynaeco-oncologists, uro-oncologists etc. Each of them is a distinct speciality. Cancer is best treated by the well-qualified and experienced specialists in the cancer centre. Usually a team of doctors takes the decision on the diagnosis and treatment planning from all fields and after a joint decision the treatment is executed. You must be beware of any treatment proposed by a single specialist without any cross consultation. }

QUESTIONS BY FAMILY MEMBERS

My father does not know that he has cancer. Should we let him know about it?

It is always better to tell the patient about the cancer and its treatment. Otherwise it is difficult to treat such patients and someday, when he comes to know of it, he may feel cheated and that can be worse. Depending on the patients' literacy, maturity, and capability to understand we can explain the relevant aspects of cancer and its treatment. This will always help for the patient to take some informed decisions. It may not be necessary to reveal the complete information.

He does want to undergo treatment. We feel guilty that we have not done our best for him.

Well, if it is his informed decision it should be respected and you should get rid of your guilty feelings. Doing best is not subjecting a patient to treatment against his or her wishes. It is rather prudent to respect his wish and be supportive to him at this time rather than feeling bad. No patient should be forced to undergo a treatment for any reason.

Some patients do not want treatment for unknown fear but after additional counselling, will mostly understand the necessity of treatment and undergo the

treatment. Such patients also are encouraged to take part in decision making as far as possible.

We know that he is dying and we don't want to tell him that he is dying.

This is a matter of debate. A lot depends on the patient, his outlook, attitude in life. Some are bold enough to understand and such patients will have to be told about the prognosis rather than hide. They may have some important matters to be attended of various natures. They have to be told in a very subtle manner and over a period of time and they understand well. Initially they may feel depressed, angry, irritable, frustrated but given time most take it very well. So it is advisable to tell the patient truth only question is how much depends on his attitude , maturity and intelligence.