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HE Sharmas were a happy couple till a few weeks back. But events of the last few days turned their life upside down. Mayur, their six-year-old son was diagnosed with acute lymphoblastic leukemia, in other words, blood cancer. The family was shattered.

However, Dr Joshi, the chief oncologist, patiently explained to the Sharma family that nowadays cancer does not mean inevitable death. Advances in medical sciences have made the cure possible in many cases. What is more important is not to lose hope and fight this disease at all levels.

Although it is painful to see children, who should be playing at their age, being confined to cancer wards, it is true that just as adults children too can get cancer. Childhood cancers can occur suddenly, without early symptoms, but fortunately have a high rate of cure.

The World Health Organization (WHO) has reported that 500,000 of the estimated 2.5 million cancer patients in India are children. Though children can get cancer in the same parts of the body as adults, some types of cancer are more common in children. The most common form of childhood cancer is leukemia, which develops in the bone marrow. Other cancers often found in children are brain tumors, childhood lymphomas, Hodgkin’s disease, Wilms’ tumor, neuroblastomas, osteogenic sarcomas, Ewing’s sarcomas, retino-blastomas, rhabdomyosarcomas and hepatoblastomas. As children enter their teen years, there is also an increase in the incidence of osteosarcoma (bone cancer).

In India, the reported incidence of childhood cancer has increased over the last 25 years, but the increase is much larger in females than males. (Arora RS, Eden T, Kapoor G. “Epidemiology of childhood cancer in India.” Indian J Cancer, 2009; 46:264-273)

Leukemia: Leukemias (cancer of the blood cells) are the most common childhood cancers (about 33% of all childhood cancers). Leukemia can be acute or chronic, though most childhood leukemias are acute. In acute leukemia, the onset is sudden and, worse, rapidly if not treated. Chronic leukemia is generally milder at the beginning and worsens slowly. Acute lymphocytic leukemia or acute lymphoblastic leukemia (ALL) and acute myelogenous leukemia (AML) are the most common types of leukemia in children.

Acute lymphoblastic leukemia (ALL) is also known as “childhood leukemia” because it is the most common childhood cancer and usually occurs between 2 and 8 years old. Acute myelogenous leukemia (AML) is also called acute nonlymphatic leukemia, which usually occurs in people over age 25, but sometimes affects teenagers and children. Chronic myelogenous leukemia (CML) is also called chronic myeloid leukemia or chronic granulocytic leukemia, which is a slowly progressing disease and very rarely affects children (5 % percent of childhood leukemias). Symptoms of leukemia can be bone and joint pain, weakness, bleeding, fever, weight loss, and other symptoms like anemia. High WBC count is the main feature of majority of patients.

Brain and nervous system cancers: Brain and nervous system cancers are the second most common cancers in children and most common solid tumor cancer in childhood (about 21% of childhood cancers). The most common brain tumors are called gliomas, which occur mostly in children from birth to
Parents and doctors can explain cancer as a battle between “good” cells and “bad” cells.

15 years old. Most brain cancers of children involve the cerebellum or brain stem. Early symptoms are headaches, nausea, vomiting, blurred or double vision, dizziness, and trouble in walking or handling objects.

Neuroblastoma: This form of cancer is the second most common solid tumor cancer in children (about 7% of childhood cancers). This cancer starts in certain types of nerve cells found in a developing fetus and hence occurs in infants and young children, generally found during the first year of life. It is rarely found in children older than 10. This tumor usually occurs in the abdomen and is noticed as swelling. In majority of cases of neuroblastoma, increased levels of catecholamines or its metabolites (dopamine, homovanillic acid and vanillylmandelic acid) are found in the urine or blood.

Wilms’ tumor or nephroblastoma: This cancer starts in one, or rarely both kidneys. It is the most common type of kidney cancer in children (about 5% of childhood cancers), but is different from kidney cancer in adults. This cancer can occur in children of 6 months to 10 years of age, but occurrence is maximum in first five years of life. It is most often found in children about 3 years old and rare in children older than six years of age. It can be noted as a swelling or lump in the abdomen. Other symptoms include fever, pain, or poor appetite. Heredity may play a role in the pathophysiology of this cancer.

Retinoblastoma: It affects the retina. It is rare (less than 3% of childhood cancers). Some children have hereditary occurrence of retinoblastoma. It usually occurs in only one eye, rarely both eyes, and mostly in children younger than 5 years of age.

Soft Tissue Sarcomas: These cancers start in soft tissues, which connect, support, and surround body organs.

Rhabdomyosarcoma is the most common type of soft tissue sarcoma (about 3% of childhood cancers). It starts in muscle tissue and affects children of 2 to 6 years of age. Symptoms include pain and swelling (a lump).

Liver cancers (Hepatoma): It is a rare disease and of two types: Hepatoblastoma (can be inherited and generally occurs before 3 years of age) and hepatocellular cancer (more likely in children infected with hepatitis B or C and occurs usually in children under 4 years of age).

Bone cancers: Primary bone cancers (cancers which start in the bones) occur most often in children and adolescents. Primary bone cancer is different from metastatic bone cancer, in which cancer originates elsewhere in the body and spreads to the bone. Metastatic bone cancer is more common than primary bone cancer. Two types of primary bone cancers occur in children.

Osteosarcoma (osteogenic sarcoma) is the most common type of bone cancer in children (6th most common cancer in children) and constitutes approximately 3% of all new childhood cancer cases. It occurs in the age group of 10 and 25 years. It often causes no pain or symptoms, but sometimes there is bone pain that keeps getting worse.

Ewing’s sarcoma is a less common primary bone cancer (about 1% of childhood cancers), which can cause bone pain and mostly found in adolescents. Ewing’s sarcoma commonly occurs in hipbones, long bones in the thigh (femur) and upper arm (humerus), and ribs.

Lymphomas: Lymphoma is a tumor of the lymph tissue and can start anywhere in the body. Lymphomas are the third most common childhood cancer, but are rare in children under 5 years. Two main types are Hodgkin lymphoma (Hodgkin’s disease) and Non-Hodgkin lymphoma. These cancers start in lymph tissues, such as the tonsils, lymph nodes, and thymus. These cancers can cause different symptoms depending on where they are growing. They can cause symptoms like fever, night sweats, weakness, and swollen lymph nodes. Patients with a weakened immune system, have a higher incidence of lymphoma.

Hodgkin lymphoma (about 4% of childhood cancers usually affects the lymph nodes that are close to the body’s surface, (in the neck, armpit, or groin area). Non-Hodgkin lymphoma (about 4% of childhood cancers), affects lymph nodes that are found deeper in the body of children. The bowel is mostly affected, often in the area near the appendix.

Causes, Symptoms & Diagnosis
Causes: The factors that cause cancer in children are generally not the same that can cause cancer in adults (smoking or exposure to environmental toxins). In majority of cases, childhood cancers arise from non-inherited mutations (random and unpredictable) in the genes of growing cells. Rarely, there is an increased risk of childhood cancer in children with genetic diseases like Down’s syndrome. Children who have had chemotherapy or radiation treatment for a previous cancer may also have an increased risk of future cancer occurrence.

Symptoms: Symptoms of cancer like fever, swollen glands, recurrent infections, anemia etc. are also associated with other non-cancerous conditions. Hence doctors can miss early signs of cancer. Therefore, even a small symptom with low suspicion of malignancy should be verified with more confirmatory tests.

Diagnosis and Staging: To confirm the diagnosis of cancer, physical examination, laboratory tests like complete blood count (CBC), tumor markers, X-ray, Ultrasound, CT, PET or MRI scan and biopsy are done. After the child’s cancer has been diagnosed, many tests are done to determine the amount and spread of cancer in the body, which is called staging. Staging
must be done to decide the most appropriate treatment and best outcome. To stage solid tumors, the doctor examines the size of the tumor, the affected lymph nodes and surrounding area. To stage leukemia, the doctor checks the bone marrow, liver, spleen, and lymph nodes. Many different tests can be used in staging, such as X-rays, MRI, CT or CAT scans, and others. After child’s staging is complete, the treatment team develops a plan that outlines the type and duration of treatment.

**Treatment**

The treatment of cancer in children can include chemotherapy (the use of medicines to kill cancer cells), radiation (the use of radiant energy to kill cancer cells), and surgery (to remove cancerous cells or tumors). The type of treatment depends on the type and severity of the cancer and the child’s age. For children with leukemia or lymphoma (which involve circulatory system and lymphatic systems located throughout the body), surgery generally plays a minor role. For these cancers, chemotherapy is the best option.

However, in children with solid tumors that do not metastasize (haven’t spread to other parts of the body), surgery can effectively remove cancer when used in combination with chemotherapy and/or radiation. Children with certain types of cancer may receive bone marrow transplants. Many types of childhood cancer are treated with radiation in combination with chemotherapy or surgery.

Many drugs used in chemotherapy carry the risk of side effects, both short-term (nausea, vomiting, hair loss, fatigue, anemia, increased risk of infection due to destruction of the bone marrow, kidney damage, bladder inflammation, liver damage etc.) and long-term (infertility, growth problems, organ damage, or increased risk of other cancers).

**Effect of Cancer on Child**

Children with cancer may feel worried and afraid sometimes, may find it hard to talk about these fears and may behave abnormally. The child may become louder or quieter than usual, show changes in eating habits, not do well in school, or resume earlier behaviors such as thumb sucking. Parents may need to talk about such changes with the doctor, nurse, social worker, teachers, and school counselor.

Children often worry about how their friends and classmates will act toward them, especially if they have missed a lot of school or return with physical changes, such as hair loss. Other students are usually accepting, but they may have questions, which can be clarified by parents and doctors. In children with cancer, replacing fear and misunderstanding with compassion and information should be the goal to cope with the illness.

**Role of Parents**

Role of parents in management of childhood cancer is the greatest. Parents should equip themselves with information about the type of cancer and stage of the disease, tests required and whether they are painful, choices (including a clinical trial), schedules, durations, success rates and side effects (immediate and long term) of treatments, the best place to receive the treatment (home or hospital), and duration of hospital stay.

Children usually know when something is wrong (not feeling well, frequent doctor/hospital visits, having many tests etc.). It is important to be open and honest with the child. Being honest lets the child knows that parents understand and accept his/her feelings and helps the child trust parents. Talking with the child about cancer prevents misconceptions, reduces stress, increases child’s cooperation for treatment, increases family bonding and makes dealing with the cancer easier for everyone.

Care should be taken to avoid feelings of depression in the child. How much information should be told depends on the age of the child and level of understanding. When cancer affects younger children (younger than age 4), parents can tell them that they are “sick” and need “medicine” to get better which is sufficient. In case of older children, facts about the specific type of cancer and its effects should be explained.

When the child asks, “Why did I get cancer? Or “Why me?” parents should emphasize that cancer is neither his/her fault, nor contagious. The child can be told that cancer is a serious disease, but that treatment (medicine, radiation, or an operation) has helped get rid of cancer in many children, and doctors are trying their best to cure his/her cancer, too. Presence of caring people around makes the child feel more secure.

It is important that the child’s fears are properly addressed. Parents should explain ahead of time about the cancer, treatment, and possible side effects in a positive way. For example, parents and doctors can explain cancer as a battle between “good” cells and “bad” cells, and treatment will help the good cells to become stronger than bad cells and when good cells destroy the bad cells, he/she can feel better and play without getting tired. Whenever possible, options could be given to the child, like taking medicine mixed with his/her favorite fruit juice.

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