

Diagnosis and Treatment of Brain Cancer

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ABOUT THE STUDY

Brain tumor uncontrolled growth of cells in the brain tumor refers to various tumors that affect different types of brain cells. Depending on the location and cell type, brain tumors may grow rapidly or slowly over many years. Brain tumors are often difficult to treat and a complete cure is often unreachable.

Causes and symptoms

The causes of various brain tumors are still largely unknown. However, researchers have identified several risk factors, including exposure to ionizing radiation and x-ray of the head at therapeutic doses (as opposed to diagnostic doses); suppression of the immune system, which may be associated with immunosuppressive therapy or immunodeficiency diseases (especially genetic diseases); history of cancer family. Symptoms of brain tumors vary greatly depending on the location of the tumor. The tumor grows and pressure on nearby areas of the brain can interfere with the functions that those areas control and may indicate the presence of many brain tumors which are first discovered after chronic headaches, and seizures may be associated with brain tumors. Symptoms may also include vomiting, nausea, and numbness in any part of the body.

Diagnosis and prognosis

If a brain tumor is suspected, neurologic tests are done to check general brain function. Imaging methods such as x-rays, Computed Tomography (CT), and Magnetic Resonance Imaging (MRI) are commonly used for further diagnosis. Tumor location and stage can also be determined using a Positron Emission Tomography (PET) scan. Blood supply to tumors can be assessed using an x-ray examination called angiography. A definitive diagnosis usually requires removal of brain tissue for analysis and this is done during tumor removal surgery. In other cases, accesses to the tumors are usually not diagnosed until symptoms appear, and survival rates vary greatly by type and location and

some are completely curable. Slow-growing cancers can progress over decades, while other types of cancer can kill him/her within 6-8 years. However, some rapidly growing tumors have an average survival time of less than one year.

Treatment

Surgery is the most common approach to treat brain tumors. Such surgeries may cure some cancers, but in others, it only relieves symptoms and prolongs survival. Complete resection of the tumor is often not possible. Radiation therapy can be used to cure some brain tumors, but some do not respond to radiation therapy. Irradiation is generally most effective for fast-growing seeds. Radiation therapy typically uses x-rays that pose risks to healthy brain tissue, so it is important to minimize exposure to normal cells surrounding the tumor. This is achieved through a special process of concentrating the radiation. For example, a device called a gamma knife that emits a highly controllable beam of radiation can be used. However, even if the radiation is localized, radiation therapy can cause side effects such as vomiting, diarrhea, and skin irritation. Radiation to the brain causes the formation of scar tissue, which can lead to future problems such as amnesia which can also occur.

Chemotherapy is used for some brain tumors, but the brain protective barrier prevents many chemotherapy drugs from reaching the brain through the bloodstream. Chemotherapy is most effective for rapidly growing tumors but is generally not beneficial and causes side effects similar to radiation therapy. Radiation therapy and chemotherapy are often used when general health or tumor location prevents surgery.

Prevention

In a rare case, family or personal history of frequent head x-rays suggests an increased risk of brain tumors, regular screening by a neurologist may allow early detection of cancer. Otherwise, there is no known way to prevent brain tumors.

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Received: 20-Jun-2022, Manuscript No. JCSR-22-19028; **Editor assigned:** 24-Jun-2022, Pre Qc No. JCSR-22-19028 (PQ); **Reviewed:** 08-Jul-2022, Qc No. JCSR-22-19028; **Revised:** 15-Jul-2022, Manuscript No. JCSR-22-19028 (R); **Published:** 22-Jul-2022, DOI: 10.35248/2576-1447.22.7.498.

Citation: Kumar S (2022) Diagnosis and Treatment of Brain Cancer. J Can Sci Res.7:498.

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