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Pathology Summit 2018: Tumor infiltrating cytotoxic CD8 T-cells predict clinical outcome of neuroblastoma in children - Mahtab Rahbar - Iran University of Medical Sciences, Iran.

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Neuroblastoma is often infiltrated by inflammatory cells. One probable part of these inflammatory cells is that they represent a cell-mediated immune response against cancer. CD8 + lymphocytes are a known crucial component of cell-mediated immunity. This study was to explore the prognostic value of CD8 + cytotoxic lymphocytes infiltrating tumors in neuroblastoma. The tumor infiltrating CD8 + lymphocytes were evaluated by immunohistochemically staining of the tumor tissues of 36 neuroblastomas from April 2008 to May 2015. The number of CD8 + T cells was counted in the tumor nest (intra-tumor) and in the fibro-vascular stroma of the tumor (peritumoral) and their relationship to the clinical pathological outcome has been determined. The total number of CD8 + cells was inversely correlated with the tumor histological grade (P <0.001), vascular invasion (P <0.001), capsular invasion (P <0.002), calcification (P <0.005), tumor necrosis (P <0.001), invasion of regional lymph nodes (P <0.003), distant metastases (P <0.003), stage (P <0.003) and was positively correlated with presentation of l N-myc oncogene (P <0.002) in neuroblastoma. However, there was no correlation between the patient's age, sex and tumor size with CD8 + cell infiltration (P <0.097, P <0.142 and P <0.722, respectively). In this analysis, the total number of CD8 T cells was a dependent prognostic factor in children. Total number and CD8 stromal lymphocytes were associated with better patient survival (P <0.003 and P <0.05, respectively) in children. CD8 T lymphocytes have anti-tumor activity and influence the behavior of neuroblastoma and could potentially be exploited in the treatment of neuroblastoma.

Neuroblastoma is a malignant tumor that twitches in the nervous tissue of infants and very young children. The abnormal cells are often found in the nervous tissue that is present in the unborn baby and later develops into a detectable tumor. Neuroblastoma is a cancer that expands from immature nerve cells found in several regions of the body. Neuroblastoma most often occurs in and around the adrenal glands, which have origins similar to nerve cells and are located at the top of the kidneys. However, neuroblastoma can also growth in other amounts of the abdomen and in the chest, neck, and near the spine, where groups of nerve cells exist.

Neuroblastoma most commonly affects children 5 years of age or younger, although it can rarely occur in older children. Some forms of neuroblastoma go away on their own, while others may require more than one treatment. Your child's neuroblastoma conduct options will be contingent on several factors

Symptoms

The signs and symptoms of neuroblastoma vary depending on the part of the body affected.

Neuroblastoma in the abdomen - the most common form - can cause signs and symptoms such as:

• Abdominal pain

• A mass under the skin that is not sensitive to touch

• Deviations in bowel habits, such as diarrhea or constipation

Neuroblastoma in the chest can cause signs and symptoms such as:

• Wheezing

• Chest pain

• Eye changes, including drooping eyelids and uneven pupil size

Other signs and symptoms that may indicate a neuroblastoma include:

• Pieces of tissue under the skin

• Eyeballs that appear to protrude from orbits (proptosis)

• Dark circles, similar to bruises, around the eyes

This work is partly presented at 15th Global Experts Meeting on Pathology and Laboratory Medicine, July 02-03, 2018 held at Bangkok, Thailand.

• Back ache

• Fever

• Unexplained weight loss

• Bone pain

Background

Neuroblastoma is the most common extracranial solid tumor in early childhood. It is an embryonic malignant tumor of the sympathetic nervous system resulting from neuroblasts (pluripotent sympathetic cells). In the developing embryo, these cells invaginate, migrate along the neurosis and inhabit the sympathetic ganglia, the adrenal medulla and other sites. The distribution patterns of these cells are correlated with the presentation sites of the primary neuroblastoma.

The age, stage and biological characteristics encountered in tumor cells are important prognostic factors and are used for risk stratification and treatment allocation. The differences in results for patients with neuroblastoma are striking

Neuroblastoma is the most common malignant (cancerous) extracranial tumor in childhood. It develops from the tissues that form the sympathetic nervous system, which is the part of the nervous system that regulates the involuntary functions of the body. The tumor usually starts in the nervous tissue of the adrenal gland (above the kidney), but can also start in the nervous tissue of the neck, chest, or pelvis. Although neuroblastoma is often present at birth, it is usually not detected until the tumor begins to grow and compress the surrounding organs.

Cancer cells can quickly metastasize (spread) to other parts of the body, such as the lymph nodes, liver, lungs, bones, central nervous system, and bone marrow. Nearly 70 percent of children diagnosed with neuroblastoma will have metastatic disease. About 650 children in the United States are diagnosed with this tumor each year, and most children affected by the disease are diagnosed before the age of 5. Neuroblastoma occurs with a slightly higher frequency in men than in females.

Most neuroblastoma cells consume irregularities linking a particular chromosome (chromosome # 1), and the most malignant tumors often have multiple copies of the MYCN oncogene in tumor cells, but a number of other genetic abnormalities can also be present. The probability that the disease is present in a future brother of a child with neuroblastoma is around 1%.

Research is underway to determine whether maternal exposure during pregnancy to toxic substances, environmental pollutants or radiation could be linked to the development of the disease. Decisions about treatment strategies should be made jointly by the parents and the child's doctor (s). A sum of factors obligation be taken into account:

• The kid's age, medical history and general health

• Extent of the disease

• Child's tolerance for specific drugs, procedures or therapies

Treatment includes a wide range of approaches. Depending on individual circumstances, these approaches are used alone or in combination:

This is done to remove the primary tumor and stage the patient to assess metastasis.

• Chemotherapy

• Radiotherapy

• Blood and marrow transplant

• Immunotherapy

Despite the assistances of these treatments, each treatment has certain associated side effects. Particular attention is paid to these side effects and to antibiotics to prevent or treat infections. Other supportive care is also provided. In addition, new methods are constantly being discovered to improve treatment approaches and decrease side effects.

As with any cancer, the prognosis and long-term survival can vary widely. Although prompt medical attention and aggressive therapy are of the utmost importance, the prognosis depends on a wide range of factors. These include:

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• Extent of the disease

• Size and location of the tumor

• Presence or absence of metastases

• Type of pathology (favorable or unfavorable)

• Biological factors, such as the number of copies per tumor cell of the N-myc oncogene, which is a tumor-specific protein

• Tumor response to therapy

• Child's tolerance for specific drugs, procedures and therapies

According to numerous predictive issues, children are careful to belong to low, medium or high risk categories, and dissimilar treatment protocols have been developed for each risk group. With current therapies, low-risk patients (stages 1 and 2) have a long-term survival rate greater than 90%, regardless of their age.

In high-risk patients with more advanced stages of the disease, survival rates decrease. The treatment of children in more advanced stages of neuroblastoma is much more aggressive, including chemotherapy, radiotherapy, and blood and marrow transplants. Despite treatment, however, the more advanced stages of neuroblastoma have a much less optimistic prognosis.

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