



MORPHOLOGICAL CHANGES IN THE MUSCULOSKELETAL SYSTEM IN YUING'S SARCOMA

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ANNOTATION

This article provides information about Ewing's sarcoma, one of the most common bone tumors in children. Clinical signs, diagnosis and treatment methods are analyzed. The main focus is on morphological changes in the bone tissue, the most common areas of bone injury.

Keywords

Damage to soft tissues, tubular bones, Ewing's sarcoma, metastasis, morphological change.

INTRODUCTION

Ewing's sarcoma is a very dangerous and rare small cell tumor that develops in bones or surrounding structures - connective, fat, muscle and nerve tissue. Sarcoma can appear at any age, but the disease is found in 75% of cases in children. According to statistics, men are more likely to get this disease than women, and the causes of the disease are not fully known. The disease is named after the New York cancer researcher James Ewing (1866-1943), who first described the tumor in 1920. Ewing's sarcoma can occur in any bone. It often grows on the pelvic bones, long tubular bones of the thigh and leg, rarely on the ribs. The tumor was found to grow both inside the bone and in the soft tissue around the bone. This sarcoma grows rapidly and metastasizes very early. At the time of diagnosis, about a quarter of sick children already have metastases. Their most common location is the lungs, bone marrow and other bones, rarely in the tissues of the head and neck, the central nervous system. Distant metastases can occur in the mediastinal and retroperitoneal lymph nodes, in the central nervous system in the form of damage to the meningeal membranes, brain and spinal cord. Currently, in the morphological study of tumors of this group, both diagnostic and differential diagnostic purposes, as well as treatment measures based on a personalized approach are being developed. The process of tumor development is accompanied by general signs of intoxication - weakness, loss of appetite, fever and weight loss. The relevance of the disease is that the tumor cell can enter soft tissues and bone marrow, causing destruction and infiltration. Damaged bone tissue thins and weakens, which leads to pathological fractures. Most patients are asymptomatic. The injured person can consult a doctor only after the pain in the broken bone.

LITERATURE ANALYSIS AND METHODOLOGY. The exact causes of the disease have not been fully studied. Some scientists found that there is a gene exchange between chromosomes 11 and 22 [1]. This means that genetic factors can also affect tumor development. A primary lesion can develop in any bone. In patients under 20 years of age, the femur and other long tubular bones are often affected, while in older people, the process has been found to start in the shoulder bone or pelvis, and the neck bones. The tumor occurs in the tubular bones - 45%, mainly in the lower part, as well as in the pelvic bones - 25% and including the trunk, ribs and spine - 20%, in other places approximately [2].

James Ewing, the scientist who first conducted research on this disease, during his microscopic analysis found that these tumor cells, different from osteogenic sarcomas, are round in shape [3]. In the

microscopic examination of the morphological features of the structure of Ewing's sarcoma, solid areas of relatively monomorphic cells with round, basophilic nuclei and thinly dispersed chromatin, without clear boundaries, with few eosinophils and cytoplasm, are predominant. It often has 1-3 nuclei of small or medium size. A large amount of glycogen is detected in the cytoplasm of tumor cells. Necrosis and apoptosis of tumor cells are often observed [4]. Despite systemic treatment, tumor-specific RNA can be detected in the bone marrow of patients with Ewing's sarcoma. Nuclear pleomorphism of tumor cells is rarely observed. A characteristic and distinctive morphological feature of this sarcoma is the presence of a well-vascularized intercellular stroma rich in branched capillary-type vessels[5].

Clinic of the disease hyperemia and temperature increase during palpation when affecting the bones of the limbs, usually with a non-specific appearance, in the affected area accompanied by the presence of painful swelling. The first sign of injury to the long tubular bones is local pain. At first, the pain is weak or moderate, then it increases and becomes constant, the patient's activity and sleepiness are disturbed, and movement in the joints close to the affected area is limited. With a metaphyseal location (in 5-10% of patients), the disease can be complicated by the development of a pathological fracture at the site of the tumor[6]. Fever and high temperature are one of the main symptoms of the disease. Clinical and biochemical changes noted include leukocytosis, anemia, increased erythrocyte sedimentation rate, and increased lactate dehydrogenase activity. Almost 90% of patients developed metastases before systemic therapy[7]. Metastatic changes can be seen mainly in the lungs, liver and lymph nodes.

Histological examination is necessary for diagnosis, for which tumor tissue is examined under a microscope. Morphological changes in cells in Ewing's sarcoma do not allow to make a final diagnosis, so additional studies are prescribed to clarify it, for example, molecular genetic analysis that identifies chromosomal abnormalities characteristic of this neoplasm. Magnetic resonance imaging, radiography, positron emission tomography is performed. Before such a diagnosis begins, a radioactive substance is injected into the patient, which is absorbed by actively growing cells, including cancer cells. Then a scan is made that shows any, even the smallest clusters of them. This method is prescribed in case of suspicion of metastases[8]. A general and biochemical blood analysis is carried out. Liver and internal organs are evaluated.

Treatment depends on the stage of the disease and many other factors affecting the patient's condition. In most cases, chemotherapy is prescribed first. High-dose chemotherapy is a very effective treatment for Ewing's sarcoma, but it has a number of serious side effects, including damage to the stem cells in the bone marrow that make new blood cells[9]. In addition, chemotherapy can negatively affect women's reproductive health and cause infertility. Surgery is performed to identify the disease and remove the tumor with the help of a biopsy. The main goal of such therapy is to completely remove the tumor and the surrounding healthy tissue. Hormonotherapy, immunotherapy, radiation therapy are carried out. Drugs used in primary oncology and preventing fractures, pain relievers are prescribed.

RESULTS

Based on the above clinical, laboratory, instrumental, histological and immunohistochemical data, it can be determined that Ewing's sarcoma is more common in men under the age of 30, mainly in long tubular bones. In patients over 30 years old, the tumor was localized in flat bones[10]. When analyzing the pathological symptoms obtained during X-ray examination of the bone apparatus, the following can be determined: expansion of the bone marrow canal in a small number of patients, and narrowing of the bone marrow canal in 87.5% of patients[11]. In patients with this osteosarcoma, a periosteal reaction of the "spicule" type was observed in 42% of cases [12]. An inflammatory infiltrate consisting of neutrophils, lymphocytes and macrophages is observed in the peripheral zone of the tumor. Radiation therapy can cause reproductive dysfunction in girls and women after treatment when the tumor is localized in the femoral or pelvic region. The younger the patient at the time of radiation treatment, the higher the probability of developing infertility in the future.

CONCLUSION

Ewing's sarcoma is a very difficult disease to develop an effective treatment strategy for patients. This is mainly due to resistance to standard treatments. Currently, none of the methods used in the treatment of patients with Ewing's sarcoma has been shown to be qualitatively superior to the others, which requires

further research in this area. Studying the morphological characteristics of the disease in bones will help to create unique drugs for targeted therapy that will ensure high treatment efficiency and survival of patients with Ewing's sarcoma.

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