

Rational Choice Of Antibiotics For Chronic Hematogenous Osteomyelitis In Children

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Abstract: Osteomyelitis is an infection of bones caused by various pathogens. Pathology can develop anywhere, but in children it is often diagnosed in the long bones of the limbs. Inflammation in adults usually affects the bones of the pelvis or spine. Early detection of the disease gives a chance to recover without complications, but late diagnosis can even lead to bone loss.

Key words: classification of osteomyelitis, clinical manifestations, types of osteomyelitis

General - in the pathological process, other tissues and organs are also involved, in addition to the site of the lesion. Clinically, it is manifested by high temperature, signs of intoxication, vomiting and pain.

Types of osteomyelitis:

hematogenous - the cause of the pathology lies in inflammatory diseases of an infectious nature;

post-traumatic - bone inflammation occurs after injury with contamination, surgical intervention for fractures, gunshot wounds;

contact - bone infection is transmitted from the focus of soft tissue inflammation;

children - the etiology of the disease is exposure to staphylococcus or streptococcus.

Classification of osteomyelitis depending on the course of the disease:

The acute form is a sharp development of the disease with an increase in temperature and pain at the site of the lesion. Over time, a fistula forms, through which pus flows.

Chronic form - if adequate treatment is not carried out, it turns into an acute form. The acute clinical picture subsides, but the pain does not allow the patient to return to normal life.

Etiology

Doctors' observations show that osteomyelitis is often detected in children between the ages of 5 and 14, and more often in boys than in girls.

Bacteria can spread to the bone from adjacent soft tissues or through the bloodstream.

Causes of osteomyelitis:

a distant site of infection (for example, a vertebral infection, which can be caused by bacteria entering from the urinary system);

a catheter inserted into a vein for a long time (for example, in dialysis patients) or an implanted prosthesis (often in the hip joint);

local infection (contaminated wound or abscess);
a source of mycobacteria such as tuberculosis;
improperly sterilized needles or syringes by people who inject drugs.
People with weakened immune systems, as well as diabetes and sickle cell disease, are at a higher risk of developing this condition. Causes of osteomyelitis include open fractures, wearing dentures, skin infections, and diabetes.

Pathogenesis

Trauma, inflammation, and foreign bodies affect the susceptibility of bone to microbial colonization by opening sites where bacterial cells can adsorb, thereby limiting host immunity. Phagocytes, tasked with stopping the infection, respond by releasing enzymes that digest the bone tissue. On the other hand, bacteria avoid phagocytic action by adhering firmly to damaged bone tissue and penetrating osteoblasts (osteogenic cells) or by covering themselves and the attached tissue with a protective biofilm rich in polysaccharides. Purulent content spreads through the circulatory system and symptoms of osteomyelitis appear.

If left untreated, the infection becomes chronic and the death of bone tissue as a result of inflammation manifests itself in the separation of large bone fragments. As a result, soft tissue abscess is formed and periosteum forms new layers of bone around the necrosis.

According to statistics, most of the diagnosed cases are characterized by an acute course, and with timely treatment, the patient will recover.

Clinical manifestations of osteomyelitis

The clinical presentation varies depending on the location of the bone lesion, the age of the patient, and the route of infection.

General symptoms of osteomyelitis

Common symptoms of osteomyelitis include:

- stinging pain;
- redness, swelling;
- temperature rise and swelling in the affected bone area;
- constant fatigue and general malaise;
- restriction of movement due to pain and swelling;
- high temperature.

Complications

Complications include:

- Bone abscess
- Pathological fracture
- Bacteremia (systemic presence of bacteria in the blood)
- Loosening of a bone implant (such as a hip replacement)
- Septic arthritis

Some people with chronic osteomyelitis need to take antibiotics on an ongoing basis to prevent the infection from spreading. Chronic osteomyelitis can destroy bone tissue. In this case, fractures are common.

A complication of bacterial inflammation can be an abscess on the skin and a purulent fistula, which is not treated until the underlying disease is treated.

Diagnosis of osteomyelitis

Early diagnosis of osteomyelitis helps prevent bone necrosis and progression of the disease to a chronic stage. First of all, an orthopedic traumatologist collects anamnesis and assesses the patient's condition. After that, an examination is carried out using palpation. It is necessary to assess the pain of the affected area, the degree of its hyperemia and the condition of the surrounding soft tissues. With the help of percussion, the source of infection is checked.

Instrumental methods:

X-ray of the affected bone - usually done without the use of contrast. Changes in bone tissue can be seen in the picture.

Scintigraphy allows 95% to make a correct diagnosis within 24 hours from the onset of the first symptoms. However, scintigraphy cannot distinguish infection from other bone changes, such as fractures.

MRI can detect anatomical changes and is the method of choice if spinal osteomyelitis is suspected.

Ultrasound - with its help, the condition of not only the bone, but also nearby tissues is evaluated.

When inflammation is diagnosed by imaging studies, samples should be taken for bacteriological examination before starting antibiotic therapy. Sometimes the type of bacteria can be determined by culture of a blood sample, but the most reliable method is to examine (biopsy) samples of pus, soft tissue or bone.

Treatment of osteomyelitis

Osteomyelitis usually requires 4-6 weeks of antibiotics in high enough doses to effectively control the inflammation. It is better to choose an antibiotic depending on the result of bacteriological examination. At first, it is better to administer antibiotics intravenously in the hospital, and then continue treatment at home using intramuscular or oral drugs.

Treatment of osteomyelitis should be comprehensive, so the patient should follow the following recommendations, for example:

Patient mode.

Limits physical activity, especially in the affected area.

Drug therapy.

It is based on the use of anti-inflammatory drugs, the main of which are antibiotics.

Detoxification of the body.

Necessary to fight bacterial waste.

Common reinforcements.

Restoring and/or strengthening the body's defenses, which shortens the healing time and accelerates the healing process.

Symptomatic treatment.

It is aimed at reducing pain, reducing temperature and smoothing other symptoms of pathology.

Physiotherapy.

It includes ultraviolet radiation, electrophoresis, exercise therapy and other methods.

In the treatment of osteomyelitis of the lower jaw, the oral cavity is cleaned with drugs that suppress the spread of the source of infection. At the same time, the dentist removes dead areas of soft tissue.

The appearance of a fracture of the jaw requires forced immobilization. Intraosseous lavage is aimed at preventing the development of complications. If a fistula appears or the process grows, surgical intervention may be prescribed.

Surgery for osteomyelitis

Sometimes surgery is required to remove necrotic tissue, such as a bone abscess, or to remove specimens for further testing.

Types of surgical treatment:

Trepanation.

Characteristic for the initial stages of pathology. The technology includes the formation of holes for drainage of purulent contents and intraosseous treatment of the affected area with antiseptics.

Open the abscess.

It is used to remove the lesion and treat the fistula. This removes areas of dead bone tissue.

Separately, reconstruction of the damaged area is carried out to restore the normal function of the bone.

For example, in the treatment of osteomyelitis of the hip joint, various resections are performed. As a result, the surgeon excises fistulas, drains abscesses, and opens pus.

Radical methods include arthrotomy and resection of the femoral head.

Treatment control

After completing the treatment, it is necessary to periodically visit the doctor to check the situation and prevent the disease from becoming chronic. In this case, instrumental diagnostic methods are mandatory.

It is important to prevent the development of complications in chronic osteomyelitis. For this, in addition to instrumental methods, constant laboratory blood monitoring is required. The rehabilitation period after the operation lasts from 6 to 12 months, depending on the severity of the operation. An individual follow-up plan for the patient is developed by the doctor who performed the operation.

Prevention of osteomyelitis

As part of prevention, wounds should be treated in time, in particular:

traumatic injuries;

surgical (operative) wounds;

diabetic foot ulcers.

If necessary, proper wound care should be combined with antibiotics.

In the treatment of infections, special attention is paid to young children, elderly patients, people with weakened immunity and those with diabetes.

Patients with implants made of metal or other materials are at particular risk for the development of the disease and require special prevention.

Tips and tricks

If you have osteomyelitis, you need to eat right:

food should be rich in protein, calcium and iron trace elements;
Do not forget to eat cottage cheese, dairy products, eggs and bananas;
limiting fluid intake to 2 liters per day;
1/3 of the diet is fresh fruit;
Divided meals should be used to ensure maximum digestion of food.

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