Marrow attenuation

Marrow attenuation [1] [2] are conditions in which hematopoietic stem cells are damaged and cease to function sufficiently; thus (pan) cytopenia develops. It may be a **primary marrow suppression**, so-called aplastic anemia, in which the stem cells die idiopathically (probably due to immune mechanisms) [2]. The **bone marrow** can also be damaged secondarily by another process, **pancytopenia** is usually milder, only temporary and resumes without treatment [2].

Clinical picture

Due to leukopenia, patients tend to have septic infections. Based on thrombocytopenia, platelet-type bleeding is present - petechiae to purpura, ecchymoses, epistaxis, gynecological bleeding, hematuria. However, major bleeding may occur, and bleeding into the CNS may be fatal.

Anemia can result in **anemia syndrome** - paleness, fatigue, shortness of breath, tachycardia - but it is less common.

Primary marrow attenuation

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Iron
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The primary marrow depression is **aplastic anemia**. There are mild, heavy and very heavy. Severe degree is defined as meeting at least two cytopenia criteria

- reticulocytes <0.1% (or 40 × 109 / l),
- neutrophil segments <0.5 × 109 / l,
- platelets 20 × 109 / l.

Aplastic anemia is thought to be caused by immune mechanisms in which noxa (eg hepatitis viruses, EBV, parvovirus B19, HIV, radiation, drugs) act as antigen-activating T-lymphocytes that cause hematopoietic stem cell apoptosis. In 70%, the launcher cannot be detected.

Diagnostika

The diagnosis is made on the basis of the peripheral blood count, in which cytopenia is present, and on the basis of bone marrow puncture and trepanobiopsy, where there is bone marrow depression (fat eyes), and exclusion is essentially performed by exclusion: myelodysplasia, myelofibrosis, chromosomal aberration, hematological or solid tumor.

Differential diagnostics

The clinical picture may be similar to the following diseases: myelodysplastic syndrome, paroxysmal nocturnal hemoglobinuria, primary myelofibrosis, lymphoproliferative disorders, rarely infections (TB, legionellosis) or severe hypothyroidism.

Therapy

Treatment with curative intent

Due to the presumed immune etiology, antithymocyte globulin immunosuppression with corticosteroids and subsequent long-term administration of cyclosporin A is used in the treatment at a milder stages [1] [2]. Allogeneic bone marrow transplantation is indicated in more severe forms and in younger patients who can handle such drastic treatment [1] [2].

Supportive care

Substitution of blood derivatives in the form of erythrocytes and platelets is applied. Prophylactic treatment with antifungals and broad-spectrum antibiotics is also in place. Stimulation of hematopoiesis by growth factors is used. [1]

Secondary marrow attenuation

In **secondary medullary attenuation**, the hematopoietic stem cell is not damaged by its own immune mechanisms, but by another etiological agent, such as **infection** or as a **side effect of drugs**. The attenuation is not so deep, usually lasts several days and adjusts on its own after the cause has been eliminated.

Among the infections, the following are used: CMV, EBV, parvovirus B19 in patients with hemolysis (hematopoietic cells with hemolysis are depleted) or very severe (anergic, hypothermic) sepsis.

Of the drugs, marrow depressions are typically caused by **cytostatics**. Occasionally, unexpected attenuation after **methotrexate** occurs even at low rheumatological doses. Attenuation is classically described as a side effect of **chloramphenicol**. Attenuations of **thyrostatics** (thiamazole, carbimazole, but also propylthiouracil) are relatively common. They may also occur after administration of older **antidepressants**.

Links

Related articles

- Aplastic anemia
- Myelodysplastic syndrome

Reference