Bleeding conditions from platelet causes

Bleeding conditions from platelet causes can occur with platelet dysfunction

1. **a decrease in their number** (thrombocytopenia)
2. **functional disorder** (thrombocytopathy).

The symptomatology of these disorders is common. It is manifested by bleeding into the skin - there may be petechiae, purpura, hematomas arising spontaneously or disproportionately to the triggering stimulus, bleeding into the mucous membranes (epistaxis, bleeding from the gums, meno-metrorrhagia, hematuria, enterorrhagia), the most serious consequences are bleeding into the retina or the CNS.

Thrombocytopenia

Thrombocytopenia can be caused by: accelerated destruction, reduced new formation of platelets or increased retention of platelets outside the circulation (mainly in the spleen). It begins to show itself as spontaneous bleeding only when it falls below 30 x 10^9/l.

Thrombocytopenia from reduced platelet production

Aplastic disorders

It accounts for the majority of thrombocytopenias from reduced platelet production. It is an **amegakaryocytic** thrombocytopenia . The amount of megakaryocytes in the bone marrow is reduced or completely absent. Attenuation of the megakaryocytic line can be isolated, but more often is the attenuation of the entire myeloid line. **Congenital** forms such as Fanconi's anemia occur. Acquired (secondary) attenuations that occur after treatment with myelotoxic substances and ionizing radiation in viral infections, infiltration of the bone marrow by a malignant process, and bone marrow remodeling in myeloproliferative diseases prevail.

Disorders of erythrocyte maturation

Megakaryocytic thrombocytopenia occurs mainly in the absence of vitamin B12 or folic acid. In megakaryocytic thrombocytopenia, megakaryocytes show various shape deviations.

Therapy

In acquired thrombocytopenia, the main therapy is the primary process, part of the marrow suppression responds to **immunosuppressants**. In appropriate cases, **allogeneic bone marrow transplantation** is used . For the symptomatic treatment of bleeding manifestations, we can administer: glucocorticoids, fibrinolysis inhibitors (e.g. PAMBA). Platelet transfusions are administered in case of severe bleeding or to ensure surgical procedures.

Thrombocytopenia from increased destruction of platelets

Autoimmune thrombocytopenic purpura

Immune thrombocytopenia is caused by excessive breakdown of platelets in the monocyte-macrophage system.

Consumption thrombocytopenia

It arises as a result of the consumption of platelets in the process of intravascular microthrombotization, most often in DIC, as well as in thrombotic thrombocytopenic purpura and hemolytic-uremic syndrome.

Thrombotic thrombocytopenic purpura (TTP, Moschowitz syndrome)

It is a rare disease condition with a serious prognosis caused by a lack of proteases that cleave von Willebrand factor. In the developed form, fever, hemolytic anemia, thrombocytopenia with bleeding manifestations, varied and variable neurological symptomatology and other organ involvement (mainly kidneys) are present. The pathogenesis is still not fully elucidated, it is probably inconsistent.

- **Idiopathic forms** – there are unusually large multimers of vWF in the plasma with the ability to induce intravascular platelet microthromboticization – multimers arise as a result of a deficiency of a specific metalloproteinase
- **Hereditary forms** – mutation of the metalloproteinase gene (chromosome 9)
- **Acquired forms** – antibodies against metalloproteinases
- **Secondary TTP** can occur in patients after allogeneic transplantation, in systemic diseases, generalized malignant processes, it can also be induced by drugs (quinine, ticlopidine, mitomycin, ciclosporin). The main complication is infection. The disease has a serious and violent course with the risk of ischemia and bleeding into the CNS, kidney failure.

Therapy: fresh frozen plasma, exchange plasmapheresis, in recurrent forms of immunosuppressant (prednisone, cyclophosphamide, rituximab).

Hemolytic uremic syndrome (HUS, Gasser's syndrome)

It is an organ limited form of Moschcowitz purpura.

- **Epidemic form** – childhood disease preceded by prodromal enterocolitis (hemolytic anemia, thrombocytopenia, renal impairment)
- **Sporadic form** – intestinal symptomatology is absent, it has a more varied clinical picture

Therapy for epidemic forms: anti-infective and symptomatic, sometimes temporary hemodialysis is used.

Thrombocytopenia from increased sequestration

Increased retention of the pool of total platelet mass outside the circulation is most common in splenomegaly of various pathogenesis. Bleeding manifestations are usually absent or mild.

🔎 *For more information see Thrombocytopenia.*

Thrombocytopathy

Thrombocytopathies are conditions from disorders of platelet functions, they can be congenital or acquired. Bleeding manifestations, prolonged bleeding, and the finding of a normal platelet count are typical. Seeding petechiae and purpura are less pronounced.

Congenital thrombocytopathies

Bernard-Soulier syndrome

- Adhesion of platelets is broken, there are deviations of the surface membrane of the platelets.

Platelet type of von Willebrand disease

- Platelets are rapidly destroyed because the affinity of the platelet surface glycoprotein for vWF is increased.

Glanzmann's thrombasthenia

- A rare autosomal recessive primary aggregation disorder where the ability of platelets to aggregate is completely absent.

Thrombocytopathy with irreversible aggregation disorder

- Bleeding conditions are usually only mild.

Thrombocytopathy with storage granule disorder

- Platelets lack granules.

Thrombocytopathy with impaired signal transduction

- An irreversible aggregation defect in signal transduction metabolism is present.

Acquired thrombocytopathies

They are disorders of platelet function that arise secondary to a number of disease states. Platelet function may be impaired: in **myeloproliferative diseases**, in **chronic renal disease with uremia** (hemodialysis is followed by correction of platelet function deviations). Furthermore, in **monoclonal gammopathy** (multiple myeloma), drug-induced thrombocytopathy due to inhibition of platelet functions: NSA (ASA, clopidogrel, indomethacin, ibuprofen). It is clinically manifested by bleeding after trauma or surgery, rarely by spontaneous bleeding in pure thrombocytopathy. Diagnosis is based on a normal platelet count and prolonged bleeding time. Therapy: causal therapy with a known cause leads to adjustment of hemostasis. In case of bleeding complications or during preparation for surgery, platelet transfusions or non -specific hemostyptics should be administered.

🔎 *For more information see Thrombocytopathy.*

Related articles

- Platelets
- Thrombocytopathy
- Thrombocytopenia

References

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