UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Blood and Immune System Disease

2425-2-I0303D007-I0303D033M

Aims

The student must be able to characterize the blood cellular and biochemical composition and describe the principal diseases of the hematological, immunological and coagulation systems

Contents

At the end of this course, the students must have learned about the consequences of an altered function of the hematopoietic, immunologic, and coagulation systems.

Detailed program

Monza
BLOOD AND BLOOD CELL MORPHOLOGY.
Composition of blood and morphological characteristics of blood cells. Hematopoiesis and hemocateresis. Pathophysiology of leukocytes, red blood cells and platelets. Characteristics and properties of stem cells. Plasma composition. Mechanisms of activation and inhibition of blood coagulation.
BLOOD DISEASES.
The Anemias. Thrombocytopenias. Acute and chronic leukemia (definition and diagnostic framework). Myelodysplasias and myeloproliferative diseases (outline). Lymphoproliferative diseases and plasma cell dyscrasias.
DISEASES OF THE IMMUNE SYSTEM.
Multiple myeloma (with particular attention to the diagnostic process). Lymphomas (general overview).
DISEASES OF THE HEMOCOAGULATIVE SYSTEM:
the main thrombotic diseases and hemorrhagic diseases.

Bergamo
BLOOD AND BLOOD CELL MORPHOLOGY
Characteristics and properties of stem cells. Pre- and post-natal hematopoiesis. Blood function.
Composition of blood and morphological characteristics of blood cells. The smear of
peripheral blood. Red blood cells: morphological characteristics (erythrocyte membrane, hemoglobin) e
functions. White blood cells: classification (granulocytes, lymphocytes, monocytes/macrophages), characteristics
morphology and functions of each category of white blood cells. Platelets: morphology and function.
The plasma. Composition and function.
Blood count test. Qualitative and quantitative parameters.
BLOOD DISEASES
The anemias. Symptoms. Classification (hyporegenerative, loss or increased destruction anemias
of erythrocytes). Anemia diagnostic algorithm. Iron deficiency anemia and iron metabolism.
Thalassemia syndromes (physiopathology and classification). Sickle cell anemia. Aplastic anemia.
Anemia of chronic inflammation. Vitamin B12 and folate deficiency anemia. Hemolytic anemias
congenital and acquired. Paroxysmal nocturnal hemoglobinuria.
Thrombocytopenias. Definition and classification. Immune thrombocytopenic purpura. Thrombocytopenia
by alloantibodies. Drug-induced thrombocytopenia (heparin-induced thrombocytopenia). Thrombocytopenia
secondary to haematological diseases.
Leukemias (definition and diagnostic framework). Qualitative and quantitative alterations of
leukocytes. Acute myeloid leukemia (with particular focus on acute promyelocytic leukemia).
Acute lymphoblastic leukemia.
Chronic myeloproliferative diseases. Chronic myeloid leukemia. Myeloproliferative diseases
chronic Philadelphia negative (polycythemia vera, essential thrombocythemia, primary myelofibrosis).
Indolent and aggressive lymphomas (general overview). Lymphoproliferative disorders. Demonstrations
clinics, diagnosis, staging, classification (Hodgkin's lymphoma and non-Hodgkin's lymphomas). Main
differences between indolent lymphomas and aggressive lymphomas.
Multiple myeloma (with particular attention to the diagnostic process). Plasma cell dyscrasias. The
monoclonal gammopathies. Protein electrophoresis. Clinical manifestations and diagnosis.
PHYSIOLOGY OF COAGULATION
The hemostatic process. The coagulation scale. The role of the endothelium, platelets and
plasma proteins.
Primary and secondary hemostasis. Vascular damage, the role of the vessel wall, adhesion and
platelet aggregation, the activation of the plasma coagulation protein cascade. There
intrinsic pathway, extrinsic pathway and common pathway. The factor-cofactor model.
Fibrinolysis Control mechanisms. Natural coagulation inhibitors. The process of
dissolution of the thrombus by lysis of fibrin.
DISEASES OF THE HEMOCOAGULATIVE SYSTEM
Venous thrombosis. Definition. Risk factors. Clinical manifestations. Thromboembolism
venous (deep vein thrombosis, pulmonary embolism, post-thrombotic syndrome). The triad of
Virchow. Diagnosis. Prevention. Notes on anticoagulant drugs.
Arterial thrombosis Ischemia and arterial thrombosis. The main locations. Myocardial infarction e
ACS. The role of antiplatelet drugs.
Thrombotic microangiopathies (diagnostic framework). Thrombotic purpura
thrombocytopenic, hemolytic uremic syndrome. Disseminated intravascular coagulation (causes
and clinical).
Hemorrhagic diseases. The first level laboratory tests, their significance for the screening of
hemorrhagic diseases. Hemophilia syndromes (hemophilia A and B). Von Willebrand's disease.

Prerequisites

Teaching form

8 frontal lessons of 2 hours in attendance.

Textbook and teaching resource

Course notes and review.

Semester

First

Assessment method

Written Test (Thirty multiple-choice questions) to evaluate a global knowlwdge of the program.

Office hours

By appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION