

Processes involved in inflammation

1. Vascular responses: vasoconstriction, vasodilation, change of endothelium, oedema (hydrostatic pressures), increased permeability
2. Cellular responses: margination (movement to periphery), paving (adhere to endothelium), degranulation, phagocytosis, chemotaxis, emigration and diapedesis (migration through endothelium into ECM)
3. Chemical mediation: histamine (mast cells, basophils, platelets), Kallikrein-Kinin system, complement (membrane attack complex), arachidonic acid derivatives, nitric oxide and cytokines.

Types of inflammation – characteristics

- Acute (neutrophils predominate) vs. Chronic (lymphocytes predominate)
- Neutrophils are the fastest to move out, and respond rapidly after injury
- Abundance in neutrophils in infarcted tissue first day, in monocytes after a few days
- Vascular component of acute inflammation: dilation of vessels; exudative component: vascular leakage of protein-rich fluid
- Causes of acute inflammation: microbial infections, hypersensitivity reactions, physical agents, chemicals, and tissue necrosis
- Chronic inflammation: ulcer and granulomatous (can be seen in tuberculosis, syphilis, Cryptococcus)
- In chronic inflammation, fibroblasts migrate into the area and lay down collagen.
- Granulomatous inflammation is a specific type of chronic inflammation
- Causes of chronic inflammation include resistance of infective agent to phagocytosis and intracellular killing, autoimmune diseases and other endogenous or exogenous materials

Blood components involved in fibrinolytic activity

Fibrosis is the most prominent feature of chronic inflammation when most of the cell infiltrate has subsided. Acute: the accumulation of neutrophil polymorph within the extracellular space. Chronic: lymphocytes; B lymphocytes, on contact with antigen, become progressively transformed into plasma cells, which are adapted for the production of antibodies. T lymphocyte is responsible for cell-mediated immunity

Which vitamins are necessary for production of which clotting factors?

Vitamin K is needed for the production of clotting factors II, VII, IX, and X

Role of chemical mediators of inflammation – histamine, prostaglandin, bradykinin

Histamine

- Mast cells, basophils, platelets
- Increase permeability, vasodilation, and endothelium activation

- Histamine release is stimulated by complement components C3a and C5a and by lysosomal proteins released from neutrophils

Prostaglandin

- Arachidonic acid derivative
- Vasodilator

Bradykinin

- Made by proteolytic cleavage in the Kallkrein-Kinin system
- Increases permeability, vasodilation, pain
- Smooth muscle contraction