Disseminated Intravascular Coagulation (DIC)

DIC is a secondary disease that results from the abnormal widespread over-activation of the coagulation cascade (either the intrinsic or extrinsic pathway). This results in thrombi formation in the microcirculation and subsequent tissue hypoxia and infarction and microangiopathic hemolytic anemia.



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Pathophysiology

Bleeding State

Bleeding State

Over-activation of the coagulation cascade leads to consumption of platelets, fibrin, and clotting factors. Without these important factors for clotting, hemorrhage results.

Activation of Clotting Factors

Activated Clogs

DIC is initiated by the release of tissue factor, which activates Factor VII in the extrinsic pathway, or the intrinsic clotting pathway via large-scale endothelial injury (the resulting exposed collagen activates Factor XII). There are many different conditions that can cause either or both.

Deficiency of Clotting Factors

Lacking available Clogs

Over-activation of the coagulation cascade leads to consumption and thus deficiency of platelets, fibrin, and clotting factors.

Causes

Sepsis

Sepsis-snake

In sepsis, bacterial endotoxins cause endothelial injury and upregulate TNF which results in tissue factor expression on endothelial cells, thus activating the extrinsic pathways.

Trauma

Trauma-spike

Trauma leads to DIC via the release of tissue factor and activation of the extrinsic pathway. Extensive surgery and severe burns may also lead to DIC in a similar fashion. Hemorrhage is the major clinical presentation in trauma-induced DIC.

Obstetric Complications

Complicated Pregnant-woman

Tissue factor released from the placenta, dead retained fetus or amniotic fluid activates the extrinsic pathway. Hemorrhage is the major clinical presentation in obstetric-related DIC.

Acute Pancreatitis

Acute-angle Pancreas-on-fire

Pancreatitis is a hypercoagulable state and can lead to over-activation of the coagulation cascade.

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Malignancy

Malignant-man

Malignancy is hypercoagulable and can lead to over-activation of the coagulation cascade.

Nephrotic Syndrome

Nerd-frog

Nephrotic syndrome is hypercoagulable and can lead to over-activation of the coagulation cascade.

Transfusion

Transfusion-IV

Acute hemolytic transfusion reactions due to ABO incompatibility may lead to DIC.

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