

Disseminated intravascular coagulation (neonatology)

Disseminated intravascular coagulation (DIC) is a secondary coagulation disorder that develops as a complication of a variety of disease states. During DIC, uncontrolled bleeding and blood clotting occur simultaneously due to impaired activation and consumption of clotting factors.

In newborns, DIC is most often accompanied by severe hypoxia and/or acidosis, for example in peripartum bleeding, severe perinatal asphyxia, meconium aspiration or sepsis.^[1]

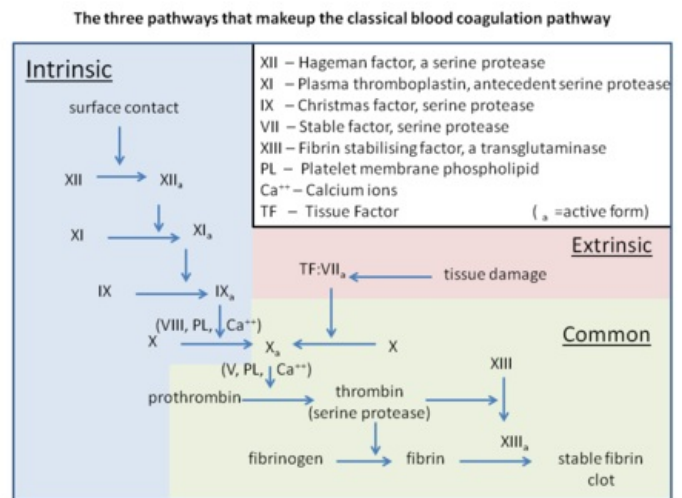
Pathophysiology

The pathophysiology of DIC is very complex and not fully understood. The release of tissue factors (TFs) and cytokines from damaged endothelium and/or monocytes appears to **activate the coagulation cascade with subsequent consumption of clotting factors**, resulting in simultaneous thrombosis and bleeding.^[1]

Clinical picture and diagnosis

Clinically, DIC occurs in sick neonates and is manifested by generalized bleeding, including pulmonary apoplexy and prolonged bleeding/sucking after venipuncture.

Laboratory findings are usually prolonged PT, APTT, and TT, low platelet count, and low fibrinogen. D-dimers are elevated, but their determination has no diagnostic value.^[1]



Coagulation cascade diagram

Reference limits of coagulation test values in healthy term newborns and adults ^[2]				
Test	Day 1	Day 5	Day 30	Adults
PT(s)	13 ± 1.43	12.4 ± 1.46	11.8 ± 1.25	12.4 ± 0.78
APPT(s)	42.9 ± 5.8	42.6 ± 8.62	40.4 ± 7.42	33.5 ± 3.44
TCT(s)	23.5 ± 2.38	23.1 ± 3.07	24.3 ± 2.44	25 ± 2.66
Fibrinogen (g/l)	2.83 ± 0.58	3.12 ± 0.75	2.7 ± 0.54	2.78 ± 0.61

APPT = activated partial thromboplastin time; PT = prothrombin time; TCT = thrombin clotting time.

Treatment

Treatment of the primary cause is essential. In the case of bleeding manifestations, *fresh frozen plasma* is administered, which contains procoagulant proteins, protein C, protein S and antithrombin. **Cryoprecipitate** contains a higher concentration of factor VIII and fibrinogen. In case of severe thrombocytopenia, platelet concentrates are administered. For bleeding unresponsive to substitution of coagulation factors with plasma and/or cryoprecipitate, **recombinant factor VIIa** (eptacog alfa, NovoSeven®) can be administered.^[1]

Summary video



References

Related Articles

- Disseminated intravascular coagulation • DIC (gynecology and obstetrics)
- Hemostasis disorders • Bleeding conditions (pediatrics)

References

1. RENNIE, JM. *Textbook of Neonatology*. 5. edition. Churchill Livingstone Elsevier, 2012. pp. 776. ISBN 978-0-7020-3479-4.
2. Andrew, M., Paes, B., Milner, R., et al., 1987. Development of the human coagulation system in the full term infant. *Blood* 70, 165-172.