Hypercoagulability and thrombosis in special ICU patient populations: How to manage critically ill patients...

Chair: Vera von Dossow

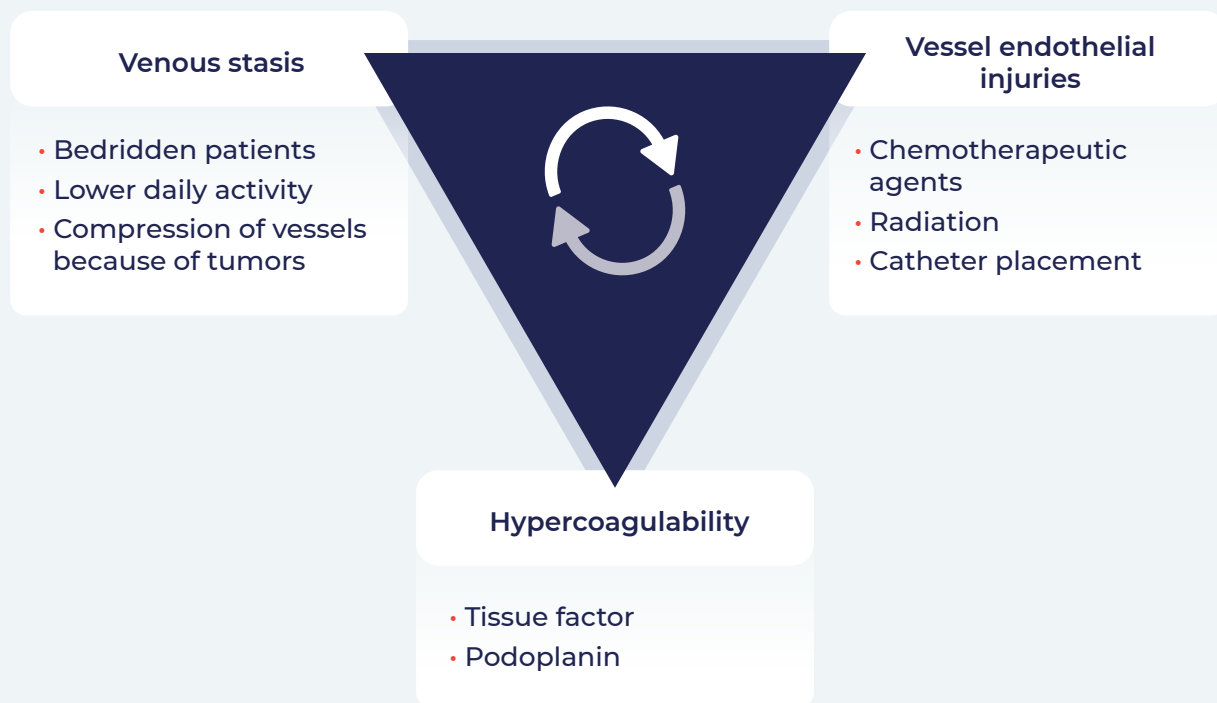
Sunday, May 26, 2024

1. ...WITH CANCERS IN BLEEDING-CRITICAL AREAS

Özlem Korkmaz Dilmen

In the last few years, several improvements have been made in the field of thrombosis associated to oncological diseases.

There are certain additional factors to the Virchow's triad contributing to oncological patients presenting an incidence of venous thromboembolism 4-7 times higher than the general population[1]:



The types of neoplasms with a higher risk of thrombosis are the following[2]:

- Cerebral
- Pancreatic
- Gastric
- Adenocarcinoma

- Pulmonary
- Ovarian
- Testicular
- Renal
- Urinary

- Metastatic disease

- Multiple myeloma
- Acute leukemia
- Lymphoma

TREATMENT OF ESTABLISHED VENOUS THROMBOEMBOLISM IN ONCOLOGY[3]

Anticoagulant treatments decrease the risk of thrombosis, but they may increase the risk of bleeding.

First-line treatment

LMWH	DOAC	UHF
• If CrCl ≥ 30 mL/min • Preferred choice vs. antivitamin K	• If the risk of gastrointestinal or genitourinary bleeding is low • If CrCl ≥ 30 mL/min • If there are no strong drug interactions or reduced absorption	• If LMWH and DOAC are contraindicated

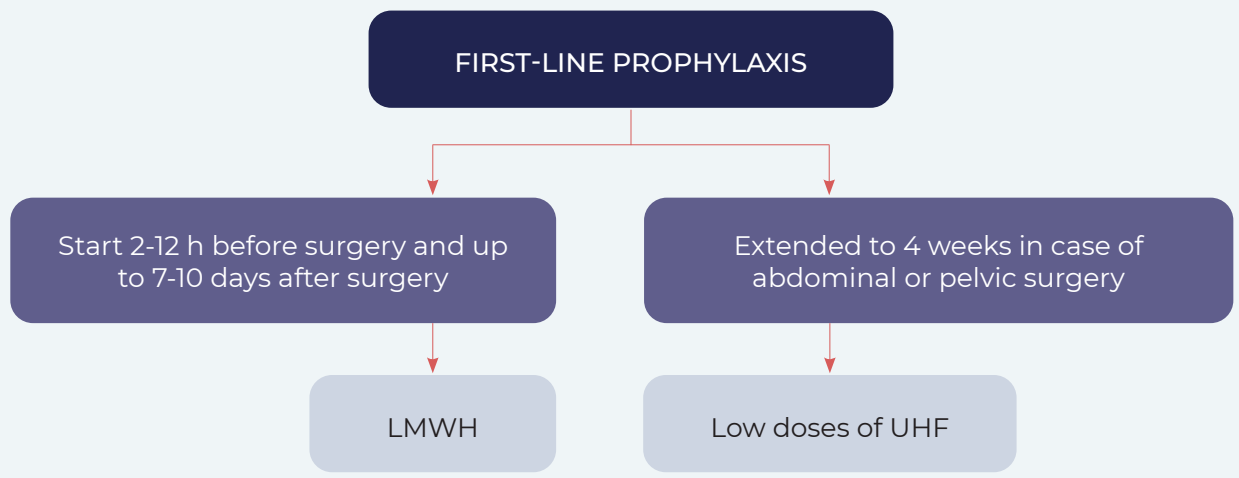
Filters in the inferior vena cava: treatment choice when anticoagulant are contraindicated or in cases of pulmonary embolism, when there is a relapse after an optimal anticoagulant treatment[3].

In cases of thrombocytopenia < 50 x 10^9, decision-making should be individualized and cautious.

CHOOSING THE BEST TREATMENT BY ASSESSING THE FOLLOWING PARAMETERS[4]:

- Risk of bleeding (kidney function, CHILD-PUGH, thrombocytopenia)
- Drug interactions
- Absorption (gastrectomy or intestinal resection, poor absorption)

PROPHYLAXIS OF POST-SURGERY VENOUS THROMBOEMBOLISM IN ONCOLOGY[3]



Currently, new strategies are required to tackle the following unmet needs:

- Reducing high rates of bleeding in patients with gastrointestinal or genitourinary neoplasms.
- Defining the best management of thrombocytopenia.
- Reducing the impact of kidney failure.
- Minimizing drug interactions.
- Optimizing the duration of the anticoagulant treatment.

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2. ...WITH LIVER CIRRHOSIS

Dana Rodica Tomescu

THROMBOTIC EVENTS THAT MAY APPEAR IN CIRRHOTIC PATIENTS[5]:

Portal vein thrombosis	Deep vein thrombosis / Pulmonary embolism	Myocardial infarction/stroke	Clots in hemodialysis circuits continuous venovenous	¡THEY ARE NOT SELF-ANTICOAGULATED!

Specifically, the risk of venous thromboembolism is two times higher in cirrhotic patients than in the general population[6,7]. The severity of the liver disease and the unbalance in cirrhosis, even when acute, may be decisive[5].

There are certain additional factors to the Virchow's triad contributing to the incidence of venous thromboembolism in cirrhotic patients:

Unbalance von Willebrand / ADAMTS13	Hyperactive platelets	Higher ability to generate thrombin	Hyperfibrinolytic state	Tissue dysfunction	Microparticles

The pathophysiologic process of the portal vein thrombosis and venous thromboembolism/pulmonary embolism is different in cirrhotic patients.

Portal vein thrombosis
Low blood flow rate in the portal vein
Endothelial dysfunction
Hypercoagulability or fibrosis?
Because of these factors, the anticoagulant treatment may not be enough

Deep vein thrombosis / Pulmonary embolism
Hypercoagulable state

TREATMENT OF PORTAL VEIN THROMBOSIS

- Treating portal or splenic vein thrombosis with LMWHs as a first line as soon as possible.
  - It can be switched to antivitamin K.
  - It can be switched to a DOAC:
    - Severe liver dysfunction may affect pharmacokinetics.
    - Severe cirrhotic patients were excluded from RCTs.
    - Caution should be used, and further studies are required to determine which is best in this population.
    - Risk of bleeding similar to antivitamin K and higher rechanneling rate[8].
    - Treatment and follow-up for 3-6 months.
- A transjugular intrahepatic portosystemic shunt (TIPS) can be performed if thrombosis progresses despite the anticoagulant treatment.

TREATMENT OF VENOUS THROMBOEMBOLISM

- In the treatment of deep vein thrombosis and pulmonary embolism, LMWHs, antivitamin K, and DOACs seen safe and effective to prevent relapse of major events, such as venous thromboembolism or ischemic stroke[9].
- Thromboprophylaxis using LMWHs or DOACs in hospitalized patients (CHILD-PUGH A or B) has an acceptable safety profile.
- The risk of bleeding must be assessed on an individual basis and with caution at the start of the treatment. Other than that, it must be reconsidered in case of further clinical events.
- Thrombotic complications in critical patients should be treated and monitored in a personalized manner.

CSL Behring

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3. ...ON EXTRACORPOREAL MEMBRANE OXYGENATION

Sascha Treskatsch (Berlin, Germany)

Patients with extracorporeal membrane oxygenation (ECMO) are the most complex ones, as well as patients in critical units. ECMO presents a number of associated problems that may trigger both a thrombotic state and hemorrhages.

There are only two clinical practice guidelines that review anticoagulation during ECMO[10,11]. These are the current recommendations:

- The use of UHF is recommended for anticoagulation during ECMO.
  - Pharmacokinetics present interpersonal variability.
  - Assessing anti-Xa is suggested to monitor anticoagulation with UHF with anti-Xa target values of 0.3 - 0.5 U/mL.
  - There is a risk of heparin-induced thrombosis in 0.2 - 5% of adult population.
  - One of the benefits is the existence of the specific antidote: protamine.
- In patients with actual or suspected heparin-induced thrombocytopenia, switching anticoagulation to direct thrombin inhibitors is recommended.
  - Its current use is off label.
  - Further evidence is still needed, but the switch seems safe[12,13].
  - Starting with 0.02 – 0.05 µg/kg/min of bivalirudin is suggested (aPTT 1.5 - 2 times above the normal value).
- Monitoring of the treatment is suggested using the activated partial thromboplastin time (aPTT), although there is yet no robust evidence to this regard[14].
  - Using institutionalized protocols is recommended for dosing and monitoring.
  - Monitoring at the point of care allows to predict bleeding, but it does not improve clinical outcomes[15].
- Antithrombin should be monitored in patients with thrombosis.
- ECMO without anticoagulation is not recommended.

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