CURRENT ISSUES OF ANTICOAGULATION

Surgical treatment of anticoagulated patients and patients with bleeding disorder

BLEEDING DISORDERS
Haemorrhagic diathesis

1) Vasculopathies

(e.g. Marfan diseases – pathologic collagen; endothel dysfunction)

2) Thrombocytopenia

(autoimmune, ITP, secondary, iatrogen)

3) Thrombocytopathies

(e.g. Bernard-Soulier dis. – GpIb defic von Willebrandt deiseases)

4) Coagulopathies

(factor deficiency, Haemophylia A, B, C, vW-diseases 400000 haemophylic patient on the world)

5) Hyperfibrinolysis

(Thromboembolic disorders e.g. DIC, protein C, S, deficiency, antithrombin III deficiency)

6) <u>Anticoagulant treatment or thrombocyte aggreagation inhibition treatment</u>

INDICATIONS OF ANTICOAGULANT THERAPY

- **thrombophlebitis**
- **Pulmonal embolism**
- **Acute myocardial infarction**
- **Cardiomyopathy**
- **Arteficial heart valve**
- **Cerebral thrombosis**
- **Atrial fibrillation (arrhythmias)**
- **Vitium**

Incidence/100000 /year

• **Deep venal thrombosis**	**159**
• **Pulmonal embolism**	**139**
• **Fatal pulmonal embolism**	**94**
• **Acute myocardial infarction**	**600**
• **Fatal acute myocardial infarction**	**300**
• **Cerebral thrombosis**	**600**
• **Fatal cerebral thrombosis**	**396**
• **Total fatal thrombosis**	**790**
• **Total cancerous fatal outcome**	**222**

Bick, R. L. et al.: Clin. Appl.Thromb/Hemost. 1997

PATHOPHYSIOLOGY OF BLEEDING DISORDERS

Steps of coagulation:

1) Vasoconstriction

2) Thrombocyte adhesion and aggregation (red thrombus formation)

3) Coagulation (fibrin net formation)

4) Fibrinolysis

Causes of increased bleeding tendency:

- haemorrhagic diathesis

- *anticoagulant therapy*

SURGICAL RELEVANCES OF BLEEDING DISORDERS

Symptoms

Skin purpura haemorrhagica, haematoma, teleangiectasies, Suffusions, melena, haematuria, increased bleedings from wounds

Complication

There is increased bleeding and blood loss during and after surgery

THE MOST OFTEN CAUSE OF PATHOLOGIC BLEEDING UNDER SURGERY IS THE ANTICOAGULANT THERAPY!

FORMS OF ANTICOAGULANT THERAPY

I. Detect the cause of bleeding disorder. (Therapy before surgery depends on the cause of bleeding disorder)

1) Anticoagulant drugs (in venous thrombosis)

A) Heparin or **low molecular weight heparin** (LMWH) e.g. enoxaparin (Clexane), nadroparin (Fraxiparine), dalteparin (Fragmin), certoparin (Sandoparin)
s.c. injection. There is possibility for fast inhibition of the anticoagulant effect (HALF LIFE TIME 4-8 HOURS). Antagonist: Protamine sulfate
The effectivity of heparin is evaluated by aPTT measurement.

B) Vitamin K antagonists (cumarin derivates, e.g. Syncumar, Marcumar, Warfarin) long effect,no immediate inhibition. (HALF LIFE TIME 72 HOURS)
Antagonist: Konakion (vitamin K; 2,5-10 ml iv.)
The effectivity of cumarin derivates is evaluated by INR measurement.

2) Thrombocyta aggregation inhibitors (in arterial thrombosis) Most often administered are: Acetilsalicyc acid (e.g. Colfarit, Astrix, Aspirin) ticlopidine, clopidogrel and thrombocyta membrane IIb/IIIa receptor blockers (Aggrastat).
HALF LIFE TIME: 7-8 DAYS!)

3) *Thrombolitic drugs:* streptokinase, urokinase, recombinant tissue plazminogene activator (rt-PA, Alteplase).

IMPORTANT INFORMATIONS ABOUT CUMARIN DERIVATES

- The following drugs increase the effect of cumarines:
  aspirin, heparin, antibiotics (sulfonamides, metronidazole, amoxicillin, erythromycin), NSAIDs, alcohol

- Effect is decreased by:
  barbiturates, diuretics, hypothyreodism

- It is recommended to change the cumarine treatment into heparine before larger surgical invention in case of chronic cumarine derivate treatment
  Cause: more effective bleeding controll, more easy to inhibit the anticoagulation.

IMPORTANT INFORMATIONS ABOUT THROMBOCYTA AGGREGATION INHIBITORS

Recently acetylsalycic acide (ASA) is the standard drug in the prevention of vascular disorders.

Ticlopidine is more effective but there are more side effects (diarrhea, anemia, neutropenia).

Clopidogrel is more effective without side effects, but expensive.

Dipyridamole is weaker then ASA and the half life time is shorter (1 day).

There are no risk of bleeding in case of low dose ASA therapy (100 mg/day).

In case of high dose ASA therapy desmopressin parenteral or rhinospray is allowed to use together with more careful local surgical treatment (suture).

THERAPY OF ANTICOAGULATED PATIENTS OR PATIENTS WITH BLEEDING DISORDERS

Tests before surgery:

- **Platelet count** (Platelet adhesion and aggregation)
- **Bleeding time**
- **INR (PT)** = International Normalized Ratio = PR^{ISI}, Norm: 1,1-2,5
  PT = Prothrombin Time (Norm:11-15 sec)
  PR = Prothrombin Rate = $PT_{examinedplasma/}$ $PT_{normalplasma} \rightarrow$60-120%)
  ISI (International Sensitivity Index) given by the lab kit producing company
  acceptable from aspect of surgery between 25-40%, 25% = 2,87 INR
- aPTT (activated partial thomboplastin time) Norm: 30-40sec
- thrombin time
- coagulating factors (IX, X, XI, V, II, XIII)
- FDP, FP-A, FP-B

THERAPIC INR VALUES

In case of oral anticoagulation therapy the INR should be between 2-4 (=15-39% Quick time).

The INR should be between 2-3 in patients with moderate risk of thrombus formation:
Thrombophlebitis
Atrial fibrillation
Dilatative cardiomyopathy
Stroke
Carotis and periferial vessel diseases

The INR should be between 2,5-3,5 in patients with high risk of thrombus formation:Arteficial heart valve
Hypercoagulational conditions

Above 4 bleeding disorder can develope! (Back to the physision!)

Cannon P.D.: 2003; Devani P.: 1998; Eichhorn W.: 2001; Torn M.: 2003

THERAPY OF CUMARINE TREATED PATIENTS

Way of surgical treatment in case of Syncumar (vitamin K antagonist) treatment:

Minor surgery: 1) INR < 2,87 → operation with minimal trauma, more careful mechanical anticoagulation (suture, tamponade, Spongostan, Surgicel,l fibrin glues, tranexam acid irrigation /Exacyl/sutura)
Dicynone-etamsilate can be admininistered (antifibrinolytic effect)

2) INR > 2,87 → consultation with specialist

General anaesthaesia: Change of Syncumar to low molecular weight heparin

IT IS NOT ALLOWED TO STOP THE ANTICOAGULANT THERAPY WITHOUT CONSULTATION WITH SPECIALIST!

THERAPY OF THROMBOCYTA AGGREGATOR INHIBITOR TREATED PATIENTS II.

- **In case of low dose administration of ASA (max. 100 mg/nap) we do not expect any complication due to surgical invenstion**

- **In case of high dose administration of ASA (above 100 mg/nap) parenteral administration (nose spray) desmopressin is indicated**

THERAPY OF THROMBOCYTA AGGREGATOR INHIBITOR TREATED PATIENTS I.

<u>Way of surgical treatment in case of thrombocyta aggregation inhibitor treatment:</u>

Minor surgery: → operation with minimal trauma, more careful mechanical anticoagulation (suture, tamponade, Spongostan, Surgicel,l fibrin glues, tranexam acid irrigation /Exacyl/sutura)
Dicynone-etamsilate can be admininistered (antifibrinolytic effect)

General anaesthaesia: INR controll

<u>Way of surgical treatment in case of factor deficiency (haemophylia):</u>

Before surgery factor replacement is necessary in haematology institute

Tranexam acide (Exacyl)

Inhibits the fibrinolytic effect of plasmin

antihaemorrhagic effect.

Dose: iv. 2-3x10 mg/kg/die,

po. 2-3x25 mg/kg/die.

Surgical- dental relations of combined thrombocyta aggregation inhibitor ttherapy

Combined administration of Plavix (clopidogrel) and Aspirin (ASA) (in case of acute coronary syndrome or after stent aplication) can lead to bleading during oral surgical invention.

In these cases the inhibition of bleeding with normally used methods is very difficult.

We have to maintain the combined therapy in case of stent because the risk of stent embolisation is very high! (Heparin replacement is not enough!)

Influence of antithrombotic drugs on oral surgical- dental inventions

YES

Head- and nec surgery
Dentoalveolar surgery
Parodontal treatments
Implantology

NO

Conservative dentistry
(filling, inlay)
Endodontic treatments
(root canal filling)
Orthodontic treatments
Prosthetic works
(crowns, bridge, prosthesis)