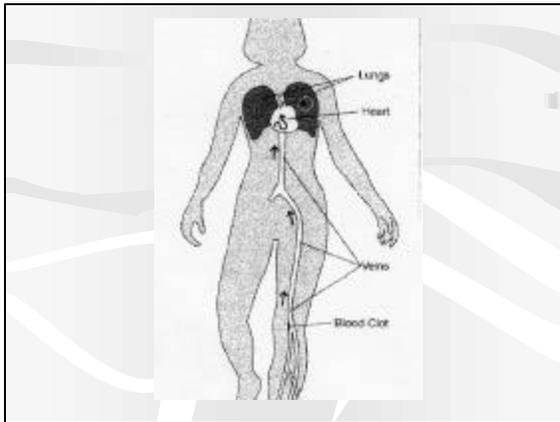


Uniformed Services University of the Health Sciences
GSN 0606 Pharmacology for Nurse Practitioners
Clinical Correlation

Case #9
Deep Venous Thrombosis
Presented by Sarla F. Duller
Greater Los Angeles

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- Over 5 M cases of DVT are estimated to occur in US/year
- Of these, 500,000 have pulmonary embolic event
- About 10% of these individuals die of PE
- Approximately 90% of clinically significant PE arise from deep veins of the lower extremities (Lipchik & Presberg, 1996)

CC:

"My calf is very painful and swollen"

HPI:

Marjorie Wagner is a 69 y.o. non-obese female with a hx of DVT about 8 years ago post out patient surgery of the (L) knee.. She was on warfarin for 3 mos. with no subsequent thromboembolic episodes. Yesterday morning she experienced calf pain w/ tenderness that worsened over the past 24 hrs. She admits to sitting in front of TV for several hours each day with no regular exercise as part of her routine ADL.

PMH:

HTN
Heart Murmur
DVT (R) leg
(L) knee surgery 8 yrs ago
Osteoporosis

FH: Noncontributory
SH: Denies tobacco or alcohol use
Meds:
Amlodipine 5 mg. PO QD
Conjugated estrogen 0.625 mg PO QD
Denies use of OTC meds.

Allergy: NKDA
ROS:
Denies SOB, CP, fever, chills, N/V
recent weight change

PE:
Gen. - awake, alert, NAD
VS - BP 140/80 TPR 36.4-96-15
Ht 150 cm, wt. 50 kg
Cor - RRR, II/VI HSM @ LLSB
Lungs - bibasilar crackles on inspiration
Abd. - soft, NT/ND, normoactive b/s x4
no masses, (-) hepatosplenomegaly
Ext. - 3+ peripheral pulses, 2+ edema
(R) posterior calf w/ erythema
(+) Homan's sign (R) calf

Labs:

- Na 142 Meq/L, K 3.4 mEq/L, Cl 104
- Bun 17 mg/dl Cr. 0.8 mg/dl
- H/H 12.5g.dl, 36.9%
- PLT 256,000/mm³, WBC 7000/mm³
- PT 12.8 sec., INR 1.2, aPTT 30 sec

Other

- Doppler Ultrasound consistent with DVT (R) anterior tibial vein
- CXR NL lung fields with mild cardiomegaly

Problem ID:

Risk Factors for DVT in this patient:

- Prior Hx of DVT
- Hx of surgery (L) knee
- Estrogen use
- Immobility/sedentary living
- Congestive Heart failure (Bibasilar crackles)
- Age >65 y.o.

Problem ID: (cont'd)

Evidence:

Subjective:

“My calf is very painful and swollen”

Objective:

- Edematous/erythematous (R) calf
- Palpable cord
- (+) Homan's (R) calf
- (+) Doppler studies for DVT

Desired Outcome:

Goals of Therapy

- to prevent the development of PE
- To prevent postphlebitic syndrome
- To reduce morbidity from acute event
- to relieve symptoms (pain, swelling)
- to achieve these objectives with minimum adverse effects and cost

Therapeutic Alternatives/Options

- Non-pharmacologic
 - Bed rest with feet ↑ above the heart
 - Leg exercises
 - Elastic compression or TED stockings
 - Intermittent calf compression devise
 - Embolectomy
- Pharmacotherapeutics

Therapeutic Alternatives/Options (cont'd)

- Pharmacotherapeutics
 - Anticoagulation - to decrease the risk of further embolic event. It does not prevent the embolization of already established thrombus .
 - Since Mrs. Wagner has no contraindication to anticoagulation:
 - Heparin - will be initiated immediately and
 - Warfarin - will be given right on the 1st day of Heparin Rx (overlapped) to allow for the delay of Warfarin effect
 - Thrombolytic Rx - Not indicated for her type of DVT

Clinical Course:

Mrs. Wagner was admitted to the hospital

Orders were:

- Bed rest, elevate feet above the heart
- Indomethacin 25 mg. PO TID with meals

Clinical Course (cont'd)

Anticoagulation regimen:

Day	aPTT (aPTT Ratio)	Heparin Dose	PT/INR	Warfarin Dose
1	Baseline 30 secs* (1.0)	4000 u IV bolus	12.8/1.2	10 mg
	6 hr post: 55 secs (1.8)	900 u/hr infusion		
2	67 secs (2.2)	900 u /hr infusion	14.2/1.6	10 mg
3	85 secs (2.8)	(↓ dose by 2 u/kg)	17.4/2.7	5 mg
4	60 secs (2.0)	800 u/hr	19.1/3.4	Dose held
5	52 secs (1.7)	800 u/hr to off	17.9/2.9	5 mg
6	Not checked	Off	16.5/2.4	5 mg

Laboratory control aPTT 20 to 30 secs, which is equivalent to a heparin concentration of 0.2 to 0.4 u/ml by protamine titration.

Optimal Plan

Assessment of Appropriateness of Intervention

- Bed rest
- Indomethacin
- Anticoagulation Regimen
 - Heparin
 - Warfarin
- Outpatient follow-up

Assessment Parameters

Clinical

- relief of s/s (calf pain, edema, erythema)
- absence of hemorrhagic complications (hematochezia, hematemesis, hematuria, hematomas, ecchymosis, etc).

Laboratory

- aPTT 1.5-2x the control
- PT1-1.5x/INR 2-2.5x the control
- Platelet count

Clinical Course

On the 8th day post discharge, Mrs. Wagner attended the Coag. Clinic for PT/INR follow-up. (PT 14.6 and INR was 1.6)

- Warfarin regimen was continued
- She was scheduled for another clinic appointment in two weeks
- She did not display any s/s of thromboembolic recurrence at this time

Patient Counseling

Important Issues About Warfarin Rx:

- Need for strict compliance
- Review Side Effects
- Carry Medic-Alert bracelet identifying med.
- Frequent PT monitoring
- Store med. In tight container and out of children's reach
- Dietary instructions
- Drug Interactions

Warfarin (cont'd)

Mechanism of Food-Drug and Drug-Drug Interaction and Effects on Coagulation

- Altered Vit K availability
- ↓ Warfarin absorption
- Changes in Warfarin absorption
- Effects on Warfarin metabolism
- Changes in receptor affinity for Warfarin
- ↓ in Vit. K dependent clotting factor levels
- Independent effect on hemostatic metabolism

Reversing the Effect of Warfarin

Clinical Situation

Recommended Rx Action

INR >20

(serious bleeding)

- Vit. K 10 mg IV (over 20-30 mins.)
- May repeat Vit. K Q 12 H, supplement w/ plasma transfusion or factor concentrate

Serious Warfarin OD

(life threatening bleeding)

- replacement with factor concentrate, Vit. K 10 mg. IV
- May repeat Vit. K PRN depending on INR

Low Molecular Weight Heparin (LMWH)

- Derived from Unfractionated Heparin (UFH)
- ↓ variable molecular wt (mean 5K daltons, compared to 30K daltons in UFH)
- ↓ patient variability
- ↓ Heparin-induced thrombocytopenia
- ↑ predictable response
- ↑ bioavailability
