VTE prophylaxis in Pregnancy

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References :

UPTODATE , ACOG , ASH and ESC , Queensland Clinical Guideline guidelines

Case #1

- 36 y/o female patient Gravid 4 , underwent NVD in 40 weeks of pregnancy.
- No PMH
- Weight : 103 kg / BMI : 35

Case #2

- 31 y/o female patient was presented in cardiology clinic for preconception evaluations.
- Past medical history : **Lower limb DVT 1 year ago following lower limb fracture**

Case #3

- 25 y/o female patient was presented with 8 weeks of pregnancy
- Past medical history : **Lower limb DVT 2 years ago following OCP**

Case #4

- 28 y/o female patient with 10 weeks of pregnancy
- Past medical history : positive APS Ab in evaluation , no thrombotic event.

questions

- *Does pregnancy consider a risk factor for VTE?*
- **Who needs thromboprophylaxis during pregnancy and post partum period?**
- **Which anticoagulant is choice during pregnancy ?**
- **Do we continue anticoagulant during delivery ?**

Question #1

Does pregnancy consider a risk factor for VTE?

The answer is : YES

Due to :

1. Hypercoagulability
2. Increased venous stasis
3. Decreased venous outflow
4. Compression of the IVC & pelvic veins by the enlarging uterus
5. Decreased mobility

VTE in obstetric patients

- **Pregnancy-associated VTE** :
  75–80% caused by DVT
  20–25% caused by PE

- **Pregnancy-associated VTE timing** :
  ½ during pregnancy :
  3rd trimester > 1st & 2nd)
  ½ during the postpartum period :
  1st week immediately after delivery

Risk Factors of VTE in pregnancy

1. Personal history of thrombosis (most important risk factor for VTE in pregnancy)
2. Thrombophilia (2nd most important risk factor for VTE in pregnancy)
3. Cesarean delivery (particularly when complicated by postpartum hemorrhage or infection)
4. Obesity
5. Hypertension
6. Autoimmune disease
7. Multiple gestation
8. Preeclampsia

VTE diagnosed during pregnancy

Antepartum : Adjusted-dose LMWH/UFH

Post partum : Adjusted-dose LMWH/UFH for a **minimum of 6weeks postpartum**.

- Longer duration of therapy may be indicated depending on the timing of VTE during pregnancy, prior VTE history, or presence of a thrombophilia.
- Oral anticoagulants may be considered postpartum based upon planned duration of therapy, lactation, and patient preference.

Reference: ACOG guideline 2011

Question # 2

Who needs thromboprophylaxis ?

No history of VTE nor thrombophilia

Case #1

- 36 y/o female patient Gravid 4 , underwent C/S in 38 weeks of pregnancy.
- No PMH
- Weight : 103 kg / BMI : 35

No history of VTE nor thrombophilia

Antepartum : Surveillance without AC therapy

Postpartum:

1- Surveillance without AC therapy

2- postpartum prophylactic AC therapy if multiple risk factors + :

1. **First-degree relative with a history of a thrombotic episode,**
2. **obesity**
3. **prolonged immobility**
4. **cesarean delivery**

Reference: ACOG guideline 2011

Heparin	Dose level	Dose
LMW heparin	[redacted]	[redacted]
		Dalteparin 5000 units SC once daily
	[redacted] ¶	[redacted] as [redacted]
		Dalteparin 5000 units SC once daily, increase as pregnancy progresses to 100 units/kg once daily
	[redacted]	[redacted]
		Dalteparin 100 units/kg SC every 12 hours

Single provoked VTE unrelated to estrogen or pregnancy, due to a transient risk factor

Case #2

- 31 y/o female patient was presented in cardiology clinic for preconception evaluations.
- Past medical history : **Lower limb DVT 1 year ago following lower limb fracture**

Single provoked VTE unrelated to estrogen or pregnancy

Antepartum :Surveillance without AC therapy

Postpartum :

Surveillance without AC therapy

postpartum prophylactic AC therapy if additional risk factors +.

Just like no history of VTE!!!

Reference: ACOG guideline 2011

ASH guideline

Postpartum: For women with a history of VTE, the ASH guideline panel recommends postpartum anticoagulant prophylaxis.

ACCP guideline

Postpartum : prophylaxis for 6 weeks with prophylactic- or intermediate-dose LMWH or vitamin K antagonists targeted at INR 2.0 to 3.0 rather than no prophylaxis

Case #3

- 25 y/o female patient was presented with 8 weeks of pregnancy
- Past medical history : **Lower limb DVT 2 years ago following OCP**

History of single unprovoked VTE

Antepartum :

Prophylactic, intermediate- dose, or adjusted-dose LMWH/UFH

Postpartum :

Prophylactic, intermediate-dose, or adjusted- dose LMWH/UFH regimen for 6 weeks postpartum

Reference: ACOG guideline 2011 , ASH 2018 , ACCP 2012

Low-risk thrombophilia

Low-risk thrombophilia

- Factor V Leiden heterozygote
- prothrombin G20210A mutation heterozygote
- protein C or protein S deficiency
- Antiphospholipid antibody.

Reference: ACOG guideline 2011 , ASH 2018 , ACCP 2012

Case #4

- 28 y/o female patient with 10 weeks of pregnancy
- Past medical history : positive APS Ab in evaluation , no thrombotic event.

Low-risk thrombophilia without previous VTE

Antepartum :Surveillance without AC therapy

Postpartum:

Surveillance without AC therapy

or

prophylactic AC therapy if the patient has additional risks factors

Just like no history of VTE!!!

Reference: ACOG guideline 2011 , ASH 2018 , ACCP 2012

Low-risk thrombophilia with a single previous episode of VTE

Antepartum :Prophylactic or intermediate-dose LMWH/UFH

Postpartum :prophylactic anticoagulation therapy or intermediate-dose LMWH/UFH

Reference: ACOG guideline 2011 , ASH 2018 , ACCP 2012

High risk thrombophilia

High-risk thrombophilia

1. Factor V Leiden homozygosity
2. prothrombin gene G20210A mutation homozygosity
3. heterozygosity for factor V Leiden and prothrombin G20210A mutation, or antithrombin deficiency

Reference: ACOG guideline 2011 , ASH 2018 , ACCP 2012

High-risk thrombophilia with or without a single previous episode of VTE

Antepartum : Prophylactic, intermediate- dose, or adjusted-dose LMWH/UFH

Postpartum :prophylactic anticoagulation therapy, or intermediate or adjusted-dose LMWH/UFH for 6 weeks (therapy level should be equal to the selected antepartum treatment)

Reference: ACOG guideline 2011 , ASH 2018 , ACCP 2012

Two or more episodes of VTE

Antepartum : Intermediate-dose or adjusted-dose LMWH/UFH

Postpartum : anticoagulation therapy with intermediate-dose or adjusted-dose LMWH/UFH for 6 weeks (therapy level should be equal to the selected antepartum treatment)

Reference: ACOG guideline 2011

Assisted reproductive therapy

No need for prophylactic antithrombotic therapy to prevent VTE !

Reference: ASH 2018 , ACCP 2012

Assisted reproductive therapy with severe ovarian hyperstimulation syndrome

Prophylactic antithrombotic therapy to prevent VTE is suggested!(ASH)

For women undergoing assisted reproduction who develop severe ovarian hyperstimulation syndrome, we suggest thrombosis prophylaxis (prophylactic LMWH) for 3 months postresolution of clinical ovarian hyperstimulation syndrome rather than no prophylaxis.(ACCP)

Reference: ASH 2018, ACCP 2012

Question # 3
which drug and what dosage?

Drugs

Heparins □ choice LMWH
Warfarin □ X
NOACs □ X

LMWH VS UFH

1. Administration
2. Evaluation
3. Bone loss
4. HIT
5. Cost
6. Renal function

Use of heparins during pregnancy

Heparin	Dose level	Dose
LMW heparin	Prophylactic*	Enoxaparin 40 mg SC once daily
		Dalteparin 5000 units SC once daily
	Intermediate¶	Enoxaparin 40 mg SC once daily, increase as pregnancy progresses to 1 mg/kg once daily
		Dalteparin 5000 units SC once daily, increase as pregnancy progresses to 100 units/kg once daily
	Therapeutic	Enoxaparin 1 mg/kg SC every 12 hours
		Dalteparin 100 units/kg SC every 12 hours
Unfractionated heparin	Prophylactic	5000 units SC every 12 hours
	Intermediate¶	First trimester: 5000 to 7500 units SC every 12 hours
		Second trimester: 7500 to 10,000 units SC every 12 hours
		Third trimester: 10,000 units SC every 12 hours
	Therapeutic	Can be given as a continuous IV infusion or an SC dose every 12 hours. Titrated to keep the aPTT in the therapeutic range.

→ 250 u/kg BID

Question # 4
pregnancy termination ?

Termination

36-37 weeks enoxaparin to heparin

Hold heparin :

- spontaneous labor
- 12 h before induction for NVD
- 24 h before CS