PRE & POST OPERATIVE MANAGEMENT OF PATIENTS ON THERAPEUTIC WARFARIN ANTICOAGULATION

Keywords: Warfarin therapy, pre-operative anticoagulation, antithrombotic therapy, prevention of thrombosis, therapeutic anticoagulation

AIM

- To provide guidance on warfarin administration and adjustment when surgery is required.

KEY POINTS

1. The decision whether to cease or continue warfarin in the peri-operative period is potentially complex and expert guidance should be obtained.
2. In women in whom warfarin is to be ceased for their surgery, a plan for when to stop the warfarin, whether bridging anti-coagulation is required and when to restart the warfarin post-operatively should be formulated in conjunction with members of the surgical, anaesthetic, haematology and medical teams where appropriate.
3. On the day before surgery (or day of surgery if required), check that the International Normalised Ratio (INR) is less than the goal INR (usually <1.5 for most procedures). Discuss with the physician performing the surgery if INR is higher than goal INR.
4. Resume oral warfarin with oral intake post-operatively, at least 12-24 hours after surgery (evening of or next morning), when haemostasis stable and after epidural catheter removal.
5. Administer the same warfarin brand (e.g. Coumadin, Marevan) that the woman was previously using, as brands are not inter-changeable.

BACKGROUND

Managing anticoagulation for women on warfarin, when surgery is planned, involves assessment and balancing of the risks of haemorrhage and thrombosis. The management of these women is potentially complex and requires multi-disciplinary input. In the case of urgent surgery, rapid reversal of warfarin effects may be required and this should be discussed urgently with the on call haematologist. Post-operative anticoagulation can increase the rate of major haemorrhage by 3%. In addition, pre-existing co-morbidities and the type of surgery also affect the risk of bleeding and/or thrombo-embolism.

ADMINISTRATION OF WARFARIN AFTER SURGERY

1. Commence warfarin at the same dose that was used for maintenance before surgery.
2. Give this dose for 3 days and measure the INR.
3. Except when a prolonged course of heparin is anticipated, commence warfarin and heparin on the same or following day.
   - Note: For women receiving bridging LMWH prior to surgery, and who have undergone surgery that has a high risk of haemorrhage, therapeutic LMWH should be recommenced >48-72 hours postoperatively.
4. When using both heparin and warfarin, blood for prothrombin time should be drawn 24 hours after last subcutaneous heparin dose.
5. From day four of treatment, titrate dose according to target INR. The target INR will depend on a number of factors including the initial indication for warfarin therapy and the type of surgery. Expert advice is recommended.
6. Measure INR every one to two days until stabilised, then measure every two to four days in hospital. The INR should be checked within one week of giving a stabilised dose, and the woman should then return to her usual regular monitoring and dose adjustment plan.
7. Do not change the dose of warfarin daily – give each dose for at least 2 days before changing.

**WARFARIN DOSAGE ADJUSTMENT**

<table>
<thead>
<tr>
<th>Day</th>
<th>INR</th>
<th>Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four and until stable</td>
<td>Less than 1.5</td>
<td>7 mg</td>
</tr>
<tr>
<td></td>
<td>1.5 to 1.9</td>
<td>5 mg</td>
</tr>
<tr>
<td></td>
<td>2.0 to 2.5</td>
<td>4 mg</td>
</tr>
<tr>
<td></td>
<td>2.6 to 3.5</td>
<td>3 mg</td>
</tr>
<tr>
<td></td>
<td>3.6 to 4.0</td>
<td>2 mg</td>
</tr>
<tr>
<td></td>
<td>4.1 to 4.5</td>
<td>1 mg</td>
</tr>
<tr>
<td></td>
<td>Greater than 4.5</td>
<td>See: Reversal of Over Treatment</td>
</tr>
</tbody>
</table>

**REVERSAL OF OVER-TREATMENT**

Discussion with the haematologist is advised in all cases.

**INR greater than 4.5 WITHOUT major bleeding:**

1. Discontinue Warfarin for two days.
3. Measure INR daily.
4. Administer intravenous Vitamin K (0.5 to 2 mg) if:
   - INR greater than 4.5, or
   - Patient at high risk of haemorrhage.
5. Give further two units of fresh frozen plasma if:
   - Haemorrhage is life threatening or
   - INR greater than 10.0.

**INR greater than 4.5 WITH major bleeding:**

1. Administer Vitamin K 5mg intravenously.
2. Administer two units fresh frozen plasma.
3. Contact Haematologist.
4. REPEAT INR.

**MANAGEMENT OF EXCESSIVE BLEEDING DURING OR FOLLOWING SURGERY**

1. Withhold warfarin and heparin.
2. Discuss with Haematologist.urgently.
3. Obtain coagulation profile and platelet count.

**REFERENCES (STANDARDS)**

National Standards –

- 1- Current Care is Guided by Current Best Practice
- 3- Medication Safety
- 7- Blood and Blood Products

Legislation - Nil

Related Policies - Nil

Other related documents –

- Clinical Guidelines, Section P: Enoxaparin; Heparin; and Warfarin
- Clinical Guideline, Transfusion Medicine Protocols: 11.2 Fresh Frozen Plasma (FFP) and Cryoprecipitate
- Clinical Guideline, Transfusion Medicine Protocols: 12.7 Prothrombinex VF (Factors II IX and X)
- MR 249.01 Gynaecology Venous Thromboembolism Risk Assessment

RESPONSIBILITY

Policy Sponsor: Nursing & Midwifery Director OGCCU

Initial Endorsement: December 1990

Last Reviewed: October 2014

Last Amended: Review date October 2017

Do not keep printed versions of guidelines as currency of information cannot be guaranteed.

Access the current version from the WNHS website