Understanding the implications of oral anticoagulation therapy

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Oral anticoagulation is an effective prophylactic or treatment measure for many indications (Baglin et al, 2005). Most patients on oral anticoagulant therapy (OAT) take the drug warfarin. This article discusses how OAT is monitored, the factors affecting the stability and control of anticoagulation, and the importance of educating patients who are on OAT.

Warfarin is a vitamin K antagonist and affects the four vitamin K-dependent clotting factors II, VII, IX and X, as well as protein C and protein S. Protein C and protein S are naturally occurring anticoagulants that prevent inappropriate blood clotting. Vitamin K is the antidote to warfarin if the international normalised ratio (INR) (an expression of the time to clot) is excessively high with no significant bleeding (Dezee et al, 2006). Fresh frozen plasma (FFP) is used in case of a bleeding emergency. A small number of patients are resistant to warfarin. In this case another anticoagulant drug is often used.

Oral anticoagulant therapy (OAT) is monitored by measuring INR regularly using a blood test. The tests become less frequent as the patient becomes accustomed to oral anticoagulation and her or his INR stabilises. The maximum time between appointments gradually rises to 12 weeks.

The INR value for a patient not yet on OAT is approximately 1.0 (0.9–1.2). As the INR increases, blood will take longer to clot and the patient will be at increased risk of bleeding (Linkins et al, 2003). At therapeutic levels (an INR of 2–3, 2.5–3.5 or 3–4) the patient will not usually experience spontaneous bleeding with the primary cause being OAT. However, if bleeding occurs for another reason, such as urinary tract infection, epistaxis or haematemesis, then it can be exacerbated by anticoagulant therapy. Therefore, if any significant spontaneous bruising or bleeding occurs then it should always be taken seriously and medical advice sought. As the INR rises, so too does the risk of haemorrhage, particularly when the INR exceeds 4 (Garcia et al, 2006).

The INR level can fluctuate due to lifestyle and biological factors that influence anticoagulation control. For this reason it is important that these factors are discussed with the patient before commencing warfarin. Commencing OAT may have major lifestyle implications for the patient.

There is little correlation between patients in terms of the dosage of OAT needed to achieve an INR of a specified value. Individualised dosing is therefore needed (Wittkowsky, 2003) and vigilance in monitoring the effect of the warfarin doses is necessary, particularly when concurrent medication has changed or the patient has been unwell.

Indications and rationale for OAT

The patient is usually commenced on warfarin to prevent or treat venous thrombosis and occasionally arterial thrombosis. Some indications for prevention of thrombosis include atrial fibrillation and mechanical heart valve replacement. Some indications for treatment are deep vein thrombosis (DVT) or pulmonary embolism (PE). The British Committee for Standards in Haematology Guidelines (Baglin et al, 2005) includes a full list of indications, target ranges and durations. It is possible for a thrombus, such as a DVT, to extend even while the patient is adequately anticoagulated (INR of 2–3). The INR target is then usually increased to a higher level such as 3.5 (Baglin et al, 2005).

Nursing care

It is essential that the patient is counselled regarding OAT before it is commenced (Tang et al, 2003) as there can be a significant risk of adverse effects such as haemorrhage. There is a direct correlation between

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Learning objectives

Each week Nursing Times publishes a guided learning article with reflection points to help you with your CPD. After reading the article you should be able to:

- Become familiar with the indications for anticoagulation;
- Understand the advantages and disadvantages of oral anticoagulation;
- Understand the importance of patient education for patients taking oral anticoagulation therapy;
- Know the importance of INR monitoring and factors affecting INR levels.

REFERENCES


OAT control, concordance and patient knowledge (Davis et al, 2005; Newell et al, 2005). Low literacy and numeracy skills have also been shown to adversely affect OAT control (Estrada et al, 2004). It is therefore very important to initiate education strategies for all patients.

A nurse, doctor or pharmacist who specialises in anticoagulation usually counsels the patient. The topics listed in Box 1 should be covered. The patient should also be given written information.

Compliance/concordance
Warfarin should be taken at approximately the same time each day to ensure the INR level remains fairly consistent. If a patient misses a dose then they should be advised not to take a double dose the next day but to inform the anticoagulant clinic. Likewise if a patient takes a double dose in error, they should contact the clinic. Warfarin doses can be complicated and it is important to suggest strategies that may assist the patient. These include recording the dose on a calendar and crossing it out when they have taken their medication. A dosset box is also a useful aid.

Another tip is to take an odd dose on dates with an even number, such as 14th, 16th, 18th and so on.

The patient should know where to obtain further supplies of warfarin, either from their GP or anticoagulant clinic. Information on the different colour tablets should be provided to reduce the risk of the patient taking the wrong dosage. If the patient may not be able to ‘mix and match’ the varying doses of tablet, or if the patient is colour blind, then a prescription for 1mg tablets should be considered.

Rationale for treatment
The explanation given to the patient depends on why OAT is recommended. The health professional recommending OAT should discuss the rationale for treatment and carry out a risk assessment.

It is important to explain to a patient with atrial fibrillation that small clots could form within the heart and if these were carried in the circulation they could cause a stroke or ‘mini stroke’ (transient ischaemic attack or TIA). OAT significantly reduces the risk of stroke or TIA caused by atrial fibrillation by 65% (Birman-Deych et al, 2006). However, as INR levels can fluctuate, warfarin requires regular monitoring. The results will either minimise the risk of extending an existing thrombus or the therapy will minimise the risk of a thrombus forming.

Duration of anticoagulation
The duration of anticoagulation is dependent on the indication in the first instance. Full guidance can be found in the British Committee for Standards in Haematology Guidelines (Baglin et al, 2005). The BCSH guidance must be used with clinical judgement and the patient’s personal and family history must be taken into account.

Vitamin K and diet
When a patient is taking OAT they should be advised to maintain a regular balanced diet to maintain consistency in their vitamin K intake (Booth et al, 1997). As warfarin is a vitamin K antagonist and vitamin K is the antidote to warfarin, the patient must not make any major changes to their diet especially where foods high in vitamin K are concerned. Foods that tend to be high in vitamin K are green leafy vegetables and salads. Cranberry juice has also been associated with an increase in INR (Mehta et al, 2006).

Alcohol
Alcohol potentiates the action of OAT, therefore increasing the INR (Mehta et al, 2006). When taken regularly, 1–2 units does not usually cause a major increase in the INR (although it can still increase INR; Havrda et al, 2005) but the patient should be advised against binge drinking due to the risks of spontaneous haemorrhage associated with a significantly high INR. It is important that nurses check whether alcohol is

REFERENCES


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Possible side-effects
Side-effects are rare but include haemorrhage, hypersensitivity, rash, alopecia, diarrhoea, unexplained drop in haematocrit, ‘purple toes’, skin necrosis, jaundice, hepatic dysfunction, nausea, vomiting and pancreatitis (Mehta et al, 2006).

Consequences of poor control
As many of the factors affecting anticoagulant control are lifestyle factors, it is important to advise the patient as to the risks of poor control. These include increased risk of thrombosis or extension of existing thrombus if the INR is too low, and increased risk of haemorrhage if the INR becomes too high.

In general it is advisable for the patient to contact their anticoagulant clinic, GP or A&E (depending on which is appropriate) if symptoms of DVT or PE worsen or if there is a recurrence of symptoms that had previously disappeared. They should also seek advice if unexplained bleeding or significant bruising occurs.

Bleeding
If patients cut themselves then it will take longer to stop the bleeding, so a prolonged period of pressure is required. But if patients are having difficulty stopping the bleeding, they should seek medical advice.

If patients injure themselves then they will bruise more easily but if they have significant bruising that is spontaneous it could indicate that their INR is high and the anticoagulant dosage requires altering.

Spontaneous bleeding rarely occurs when the INR is within therapeutic levels but if the patient has bleeding for any reason, for example urinary tract infection, peptic ulcer or epistaxis, then it will be worse because the blood will take longer to clot.

Again, the patient should seek medical advice for the primary problem even if they stop the bleeding.

It is important to reassure patients that problems with bleeding are generally rare but it is essential that they know what to do if bleeding occurs. The importance of vigilance should be stressed, especially for spontaneous bruising, bleeding in urine or rectal bleeding, including black stools.

Medication interactions
Many medications interact with OAT and the prescriber should consult the BNF. Patients should be advised to remind prescribers that they take OAT, to seek advice of the pharmacist when buying non-prescription medicines and also to seek the advice of their anticoagulant clinic as to whether an INR check is needed earlier than previously planned.

Herbal remedies should be avoided as many interact with warfarin (Ezbianski, 2003). Patients should also be aware that Chinese medicines may interact with OAT (Yu et al, 1997).

Contraception/pregnancy/HRT
Oral anticoagulants are teratogenic and should not be given in the first trimester of pregnancy. Women with a chance of becoming pregnant should be warned of this possibility and advised to use adequate contraception and to see their GP if their menstrual period is late (Mehta et al, 2006). Stopping warfarin before the sixth week of gestation may, in the main, prevent the risk of foetal abnormality. Oral anticoagulants cross the placenta with risk of placental or foetal haemorrhage, especially during the last few weeks of pregnancy and at delivery. Therefore, oral anticoagulants should be avoided in pregnancy, especially in the first and third trimesters. Pregnancy is a hypercoagulable state for any woman; it is therefore vital that the correct management of patients at higher risk of thrombosis is adhered to.

The combined contraceptive pill increases the relative risk of DVT by 3–4 times. HRT does too but due to the added factor of age the absolute risk of DVT is 10 times higher than average (Gorman et al, 2000). Discussion should take place with the patient’s haematologist or GP as to whether the combined pill or HRT should continue if there is a danger of DVT, PE or a thrombosis elsewhere in the body.

Surgery/dental treatment
Patients should be advised to let their surgeon or dentist know that they are receiving OAT. A significant amount of dental work can be carried out as long as the INR is below 4.0. If the patient requires surgery then bridging with heparin may be required to ensure the risk of thrombosis is minimised.

If a patient is admitted to hospital she or he should encourage ward staff to keep the yellow book up to date with INRs and warfarin dosages. IM injections should be avoided due to the risk of bleeding.