Use of Non Vitamin K antagonist oral anticoagulants (NOAC) vs warfarin

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Elective report

Objective 1 - Identify patients on different types of anticoagulant therapy along with indications for particular therapy, with an aim to discuss the benefits and disadvantages of both medications.

During my elective period I had to manually identify the patients using the practice emis medical record software. This was done by running various reports and identifying the associated patients on the non vitamin K antagonist anticoagulants (NOAC) medication. According to the practice software, 31 patients were on NOAC medication. Furthermore there were several different types of NOACs being used. These include apixaban, rivaroxaban, dabigatran, and with one patient on edoxaban. 17 patients were on apixaban, 2 on dabigatran and the rest on rivaroxaban (10) and one on edoxaban. The youngest patient was 19, with the oldest patient being 96 years old.

Anticoagulation is required in certain medical conditions which result in the formation of clots which can develop within the vascular system. If clots do form, this can result in nutrient deprivation to the respective tissues. Vascular disease can make patients more susceptible to strokes and transient ischaemic attacks. By anticoagulating patients who have suffered from this, there is less chance of clot formation. Atrial fibrillation on the other hand can also result in the formation of clots due to the irregular heart beat causing turbulence in the heart chambers. This can throw off clots into any part of the vascular system, thus it is important for this cohort of patients to be anti coagulated adequately if not contraindicated. Warfarin originally sold as a rat poison, is the most commonly utilised anticoagulant used today. However, it has a number of deleterious effects and in severe cases, can result in catastrophic bleeds.

Warfarin, a vitamin K antagonist, was first commercially used as rat poison in the 1940's and in the following decade was approved for medical use. Although it is a potent anticoagulant, it has many side effects and interactions with other drugs and food. Furthermore its intensive monitoring requirements make it quite a cumbersome drug to use particularly for elderly patients who tend to be those who require it in most cases. This can result in high discontinuation rates (Birman-Deych et al. 2006) and even inadequate coagulation (Connolly et al. 2008).

Due to the deleterious side effects of warfarin, there has been a need to develop new anticoagulant agents which are safe and effective to use (Hanley and Kowey 2017). NOACs have filled this void and due to their predictable anticoagulant effect. This has negated the need for routine monitoring. Furthermore unlike warfarin there is a more rapid onset and offset of action, unlike warfarin which can take several days. There is also fewer drug interactions and less influence of dietary vitamin K intake on its action. NOACs have been shown to be at least as safe and effective as warfarin (Connolly et al. 2009) and thus are a promising drug for the future of anticoagulant therapy. However, some drawbacks have been identified. Firstly, there is no specific antidote to resolve major bleeding complications with patients on NOACs. The cost also compared to warfarin is higher and importantly they are really exceed drugs and patients with renal compromise may not fully experience the full benefits of the drug. The latter disadvantage has resulted in a mandate to monitor renal function accordingly.

Objective 2 - Develop a practice protocol in line with current best practice for the correct provision of oral anticoagulant therapy for patients requiring oral anticoagulation and considering switching to NOAC.

Given that oral anticoagulation is generally managed in primary care, it is crucial to ensure that patients are managed according to evidence based guidelines. Utilising the guidance and governance document from the specialist pharmacy service (Suggestions For Therapeutic Drug Monitoring In Adults In Primary Care – SPS - Specialist Pharmacy Service – The First Stop For Professional Medicines Advice), there are several routine investigations which are mandatory to ensure that patients are being appropriately anti coagulated. This will often depend on the type or oral anticoagulant being used. In general the guidance suggests that annual FBC, LFT be taken in addition to renal function tests, depending on the choice of anticoagulant. According to the guidelines the NOAC medication guidelines are outlined in the table below

	Renal function tests depending on creatinine clearance	**FBC**	**LFT**
Apixaban	>60 = annually 30-60 = 6 monthly 15-30 = 3 monthly	annually	annually
Dabigatran	>60 = annually 30-60 = 6 monthly 15-30 = 3 monthly	annually	annually
Rivaroxaban	 30-60 = 6 monthly 15-30 = 3 monthly	annually	annually

Due to the nature of the drugs being very similar, the monitoring requirements are also thus similar. Having identified the best practice policies, I was then able to compare this to what exactly was being done at the GP surgery. As a consequence of computerisation or the medical records, a pop up note would appear for anticoagulation monitoring. This would send an alert out to the relevant personnel at the surgery to ensure that the patients had their blood done accordingly. Only four of the patients I had identified had not had their bloods booked, they were highlighted in order for the patients to be informed. At the process of re-audit, we expect this number to be even fewer.

Objective 3 - Evaluate the benefit of such medications in accordance with best practice guidelines, experience of GP's in the practice and the potential public health consequences of switching from traditional vitamin K antagonists to NOAC.

It is clear that NOAC are increasingly becoming the future of oral anticoagulation. The benefits highlighted previously would suggest this also. Amin et al (2015) identified that medical costs are reduced when NOACs are used instead of warfarin. Interestingly Janzic and Kos (2015) suggested that NOACs would be more cost effective in situations where warfarin management is poor, and may not represent value for money in good anticoagulation control.

Whilst there is great potential for these drugs to be used it is clear that GP's need to be confident in their ability to prescribe this drug. There will always be some reluctance to change from what has always been done, but it would appear as with Abbottswood medical practice that this is being enforced adequately.

From a public health perspective, much can be gained from the introduction of NOACs. There is no need for routine monitoring and as a result less need for warfarin monitoring clinics freeing up resources to be used elsewhere. Furthermore, warfarin tends to be a drug used by the elderly who with mobility issues may appreciate not having to attend so frequently. In addition there is less likelihood of life threatening bleeds which could have a knock on effect on hospital admissions and the management of patients with this serious problem. On the other hand NOACs are naturally more expensive. Due to this it could be argued that good warfarin management can actually be more cost effective. Given that NOACs are relatively new onto the market, there may be some reluctance from GP's to use this drug as it goes against what they are used to, this may also be perceived by patients who are used to taking warfarin and are happy with that. For this reason it is crucial for the GP and patient to have an open and honest discussion to see whether this novel medication is the right one for them.

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