The monitoring of DOACs in primary care, a quality improvement project

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Abstract

Direct acting oral anticoagulation plays a key role in preventing thrombotic stroke and thromboembolism. DOACs require careful drug monitoring to prevent unnecessary strokes and hemorrhage. Quality improvement projects/Audits are necessary to highlight how robust DOAC monitoring is in Primary care.

Keywords: direct acting oral anticoagulation, primary care

Introduction

Direct acting oral anticoagulation (DOAC) has a key and established role in the prevention of stroke, in patients with non-valvular atrial fibrillation (NVAF) (1). DOACs also play an important role in the management of venous thromboembolism (VTE) and more recently in the prophylaxis of VTE after elective hip or knee replacement (1,4). Warfarin has been prescribed for more than 50 years and was the drug of choice before DOACs in the prevention of stroke in patients with established AF (2). Randomized controlled studies have concluded, DOACs reduced the risk of strokes and embolic events compared with warfarin (1). In addition, DOACs as a class of drugs are safer with respect to intracranial bleeding (1,2,5). DOACs do not require regular blood test for international normalized ratio (INR), therefore they are more appealing for patients. In addition to reduced blood test monitoring, DOACs tend to have less drug to drug and food interactions (3). Patient groups considered to benefit from a DOAC include the following:

- poor INR control
- not tolerating warfarin
- recurrent drug changes
- recurrent antibiotic use
- elderly patients with difficult polypharmacy

Warfarin is still indicated in patients with metal prosthetic heart valves and AF with mitral stenosis. Warfarin is also preferred for patients with weight >120kg and those patients with renal and hepatic impairment (7).

The regular monitoring of DOACs in primary care is important to ensure patient safety (5,8). Primary care has now taken a leading role in managing the anticoagulation of patients in the community along with the help of cluster pharmacists (5). All health care providers should be aware of the monitoring requirements for DOACs to ensure safe drug prescribing.

Aims and Objectives

The key aims and objectives of this quality improvement project/audit is to review all current patients at a single GP practice on DOACS to establish the following:

1. The indication of DOAC treatment have been clearly documented
2. The duration of DOAC is clearly documented
3. Documented CHA2DS2VAS and HAS-BLED (6)
4. Patients have had an initiation appointment with specialist pharmacist
5. Initial laboratory investigations
6. Patients are being prescribed the current dose of a DOAC according to the creatinine clearance (CrCl)
7. Appropriate follow up reviews and blood tests (FBC/LFT/U+E/CrCl)
8. Up to date 3, 6 or 12 monthly blood tests according to CrCL
9. Documented weight check

Methodology and Sample

Inclusion criteria: All patients being prescribed DOACs at Skewen Health Center

Exclusion criteria: Nil

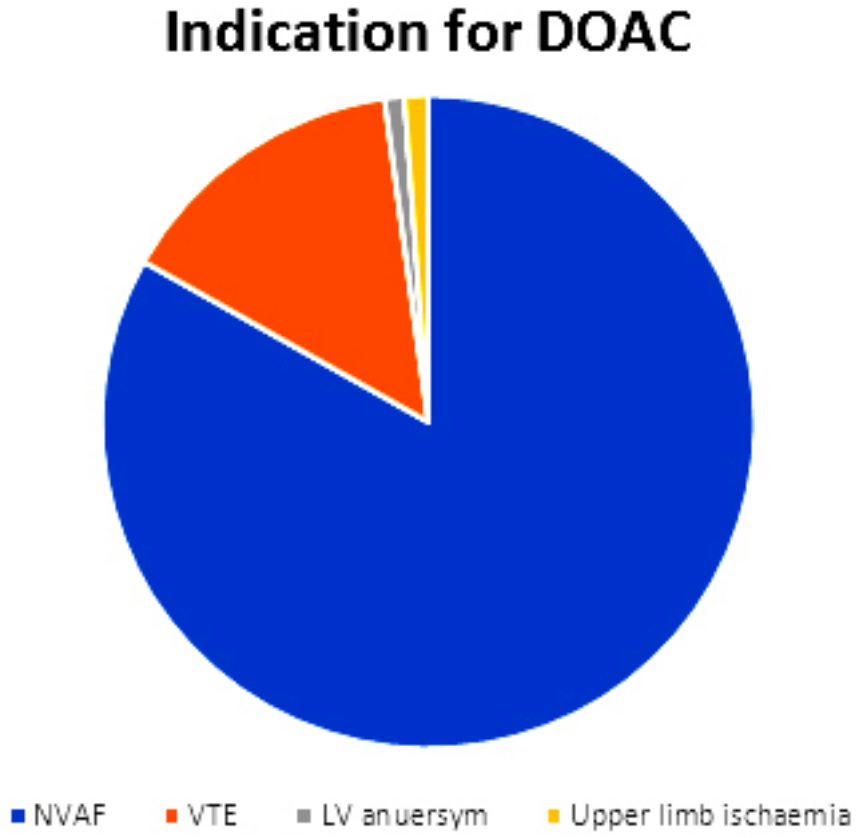
Audit type: Retrospective audit

Sampling: Total of 102 patients who were being prescribed DOACs at Skewen Health Centre. Each patient's records were carefully reviewed to assess if the aims and objectives of the audit were being met.

Date source: Electronic patient records

Results

1. The indication of DOAC treatment has been clearly documented, 100% achieved.



102 patients were being prescribed DAOCs. All 102 patients had a clear indication for DOAC treatment documented in the notes. There were 2 patients who were prescribed DOAC that were outside NICE CKS guidelines. One patient had LV aneurysm with a thrombus and DAOC initiation was by cardiology specialist. One patient was treated for upper limb ischemia; again DOAC initiation was by specialist care.

2. Duration of DOAC clearly documented. All 102 patients had clear documentation on duration of treatment. All patients were taking DOAC lifelong.

3. Documented CHA2DS2VAS and HAS-BLED scores, all 85 patients with NVAF had CHA2DS2VAS recorded, and all 102 patients had HAS-BLED recorded.

4. Patients have had an initiation appointment with specialist pharmacist. All 102 patients had an initiation appointment. The first appointment was mainly on patient education in terms of indications/side effects/ adherence/guidance on missing doses/drug interactions and reporting any unusual symptoms.

5. Initial laboratory investigations which include the following, FBC/LFT/Clotting/Serum creatinine (for creatinine clearance) and U+Es. All 102 patients had initial laboratory investigations.

6. Patients are being prescribed the current dose of a DOAC according to the CrCl. Out of the 102 patients three were identified as not taking the correct dose as per CrCl. Two patients were taking a higher dose of Apixaban, and one patient was taking a higher dose of Rivaroxaban. After reviewing these patients, we identified the dose was increased by hematology team. One patient had a DVT and cancer therefore thrombotic risk was much higher, and the dose of Rivaroxaban was increased. Two patients who were on the lower dose of Apixaban developed a DVT whilst on treatment, hence hematology team favored a higher dose.

Table 1: DOAC dose based on CrCL courtesy of www.coventryrugbygpgateway.nhs.uk

DOAC	Usual Dose	Reduce Dose	Do NOT use
APIXABAN	**5mg TWICE daily**	**Reduced dose 2.5mg bd when CrCl 15-29ml/min** or any two of the following: • Age ≥ 80 years • Weight ≤ 60kg • Serum creatine ≥ 133mmol/L	CrCl<15 ml/min
DABIGATRAN	**150mg TWICE daily**	**Reduced dose 110mg bd:** • Age ≥ 80 years • Co treatment with verapamil **Consider dose reduction when:** • Age 75 – 80 • CrCl 30-50ml/min • Gastritis, oesophagitis or reflux • Increased risk of bleeding	CrCl<30 ml/min
EDOXABAN	**60mg ONCE daily**	**Reduced dose 30mg od:** • CrCl 15-50ml/min • Weight ≤60kg • Co treatment with ciclosporin, dronedarone, erythromycin, ketoconazole	CrCl<15 ml/min
RIVAROXABAN	**20mg ONCE daily**	**Reduced dose 15mg od:** CrCl 15-49ml/min	CrCl<15 ml/min

7. Appropriate follow up reviews and blood test. All patients taking DOACs should have at least annual reviews. Patients that require more frequent reviews include:

• If the person is frail or older than 75 years, monitoring should be repeated every 6 months
• If the person has a creatinine clearance (CrCl) less than 60 mL/minute, the frequency of monitoring (in months) can be guided by the CrCl divided by 10. For example, every 5 months if CrCl is 50 mL/minute
• If the person has an intercurrent illness that may impact renal or hepatic function
• If there is drop in Hb by >1g/dL

All 102 patients were invited for a face-to-face appointment, or telephone review. Four patients did not attend. The ninety-eight patients that were reviewed met the appropriate time frame as per CrCl.

8. Up to date 3, 6 or 12 monthly blood tests according to CrCl. Out of the 102 patients reviewed, all the patients had bloods done at the correct time, even the patients that failed to attend the review appointment.

9. Documented weight, two patients did not have an annual weight check as they were bed bound and a hoist was not available. The previous weight documented in clinical, or hospital records was used. With regards to weight check, three patients were outside the reference range (<50Kg and >120Kg). Two of them were just slightly under 50 Kg, and the other patient's weight was 130kg. This patient did not tolerate warfarin, so DOAC was prescribed. All three cases were discussed with hematology team who advised to continue DOAC at the appropriate dose.

Discussion

DOAC monitoring is clearly needed for safe prescribing, incorrect dosage of DOAC can lead to serious bleeding (if the dose is high) or stroke/VTE (if the dose is low) (9). This quality improvement project/audit highlights the key requirements for good DOAC monitoring in primary care. Safe DOAC monitoring is achieved with a clinical lead, phlebotomist, and specialist pharmacist, when all team members work together high targets can be met as highlighted by this audit (5).

Overall, the monitoring of our patients in terms of indications/ clinical parameters / follow ups has been robust. Patients who were noted to be outside NICE/ESC guidelines were discussed with appropriate specialist for input and management.

A key point to note from the audit is how to manage patients who fall outside the weight category for DOACS. According to NICE and ECS guidelines patients with weights <50kg or >120kg need specialist input to decide on DOAC treatment (1). Warfarin is indicated for patients with weights >120kg but in patients who do not tolerate warfarin; DOACS can be started/continued if agreed with hematology anticoagulation lead (10).

An additional point to discuss is how to manage patients aged >80 with borderline CrCl. As Apixaban is the most common DOAC prescribed we know the dose needs to be reduced if patients meet two criteria out of three (age >80 yrs, weight < 60kg and Cr >133) or if CrCl 15-29 (1,5,11). We had two patients aged over 80 with borderline weights and CrCl. After discussion with hematology anticoagulation lead, we switched DOAC from Apixaban to Rivaroxaban. This was appropriate as Rivaroxaban dose is not dependent on age, weight, or serum creatinine (see Table 1). Another scenario that needed exploring is what dose do we prescribe patients who have borderline CrCl at review appointments. For example, patients may have a CrCl of 28 at one review and 31 at the next review. The question is do we prescribe the patient the lower dose of Apixaban 2.5mg BD or higher dose 5mg BD, bearing in mind the risk of VTE (under prescribing) and bleeding (over prescribing). We discussed these scenarios with hematology anticoagulation lead who advised to switch these patients to Rivaroxaban as there is more leeway on the CrCl (15-49). Similar principles apply to Rivaroxaban when patients have borderline CrCl which dictates the change of dose (CrCl <50). Hematology team have advised Rivaroxaban can be switched to Apixaban.

Monitoring bloods for DOACs include FBC and LFT. It is important to be aware of what to do with patients with abnormal LFTs and FBC results. All four DOACs require hepatic metabolism. DOACs are contraindicated in patients with hepatic impairment. Patients with elevated liver enzymes >2 upper limit need careful review and discussion with hematology team (1,3,4). In terms of FBC any drop of Hb by 1g/dL needs further investigation especially regarding GI bleeds and cancers (1,3). There are no clear guidelines on how often patients with abnormal LFTs or FBC need follow up reviews. It is appropriate to involve specialist care to agree on safe monitoring requirements. We suggest a 3 monthly follow up for these patients.

Conclusion

Regular, up to date DOAC monitoring is fundamental for patient safety. If monitoring requirements are not met there is a risk of preventable stroke or hemorrhage. AF stroke (thromboembolic) is associated with higher rates of morbidity and mortality, also longer hospital stays; therefore preventing this is important (10). Compared to warfarin; DOACs require less monitoring, however regular laboratory investigations, weight checks, BP checks and review appointments are required for correct DOAC dosage (1,5). This quality improvement project/audit highlighted the key monitoring requirements. DOACs are commonly prescribed in primary care so all clinicians should be aware of monitoring requirements. We also suggest discussing all complex cases with hematology anticoagulation leads as these patients may fall outside guidelines and require more specialist input deciding on DOAC treatment and monitoring requirements.

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