Audit of primary care INR monitoring following co-prescription of potentially hazardous drugs with warfarin

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Background

Warfarin is used to reduce the risk of thromboembolic events, for example in atrial fibrillation, recurrent thrombosis, or mechanical valve replacement.

The benefits of warfarin in reducing thromboembolism are dependent upon the international normalised ratio (INR) being within an indication-specific target: too low and reduction in risk is suboptimal, too high and the risk of bleeding increases.

To achieve optimal benefit from warfarin therapy, patients' INR should have time in therapeutic range (TTR) ≥58%, and ideally >60-65%[1].

Patients commenced on drugs which potentially interact with warfarin ("potentially hazardous drugs") are at increased risk of developing an INR outside the intended therapeutic range with its consequent risks[2].

Aims

To determine the proportion of patients with a suboptimal TTR in one primary care practice. Of those with low TTR, to determine the appropriateness of INR monitoring after initiation of a potentially hazardous drug.

Audit criteria and standards

The criteria (see table) were mainly taken from the Clinical Knowledge Summaries (CKS) guidelines on anticoagulation[3].

Standards were determined arbitrarily by the authors in the absence of identified published standards for these criteria.

Criteria	Source	Standard
1. Patients with TTR ≥58%	Circulation[1]	90%
2. Patients with TTR <58% have INR check at least every 12 weeks	CKS[3]	100%
3. Patients with TTR <58% are not co-prescribed potentially hazardous drug after starting warfarin	CKS[3]	90%
4. Where new prescription for a potentially hazardous drug cannot be avoided, an INR measurement is undertaken within 3-5 days from commencement	CKS[3]	90%

Methods

All patients who have their INR monitored by the practice are registered on the INRStar clinical decision support software system. The practice uses INPS Vision 3 clinical system.

INRStar produces a TTR output using the Rosendaal method[4]. We used the TTR for the preceding 12 months to identify patients with a suboptimal TTR.

Records of patients with TTR <58% were inspected in Vision to check for any potentially hazardous drug prescriptions and to determine whether an INR had been carried out in the recommended timeframe following initiation.

References
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2) British National Formulary, (2014) London: MedicinesComplete.
3) Clinical Knowledge Summaries, (2013). Anticoagulation - oral. National Institute for Health and Care Excellence,
4) inrstar.co.uk, (2014). Planning an Anticoagulation Service. [online] Available at: http://www.inrstar.co.uk/BrickwallResource/GetResource/1c205baa-4ab8-436f-99ed-438b336672d8 [Accessed 16 Sep. 2014].
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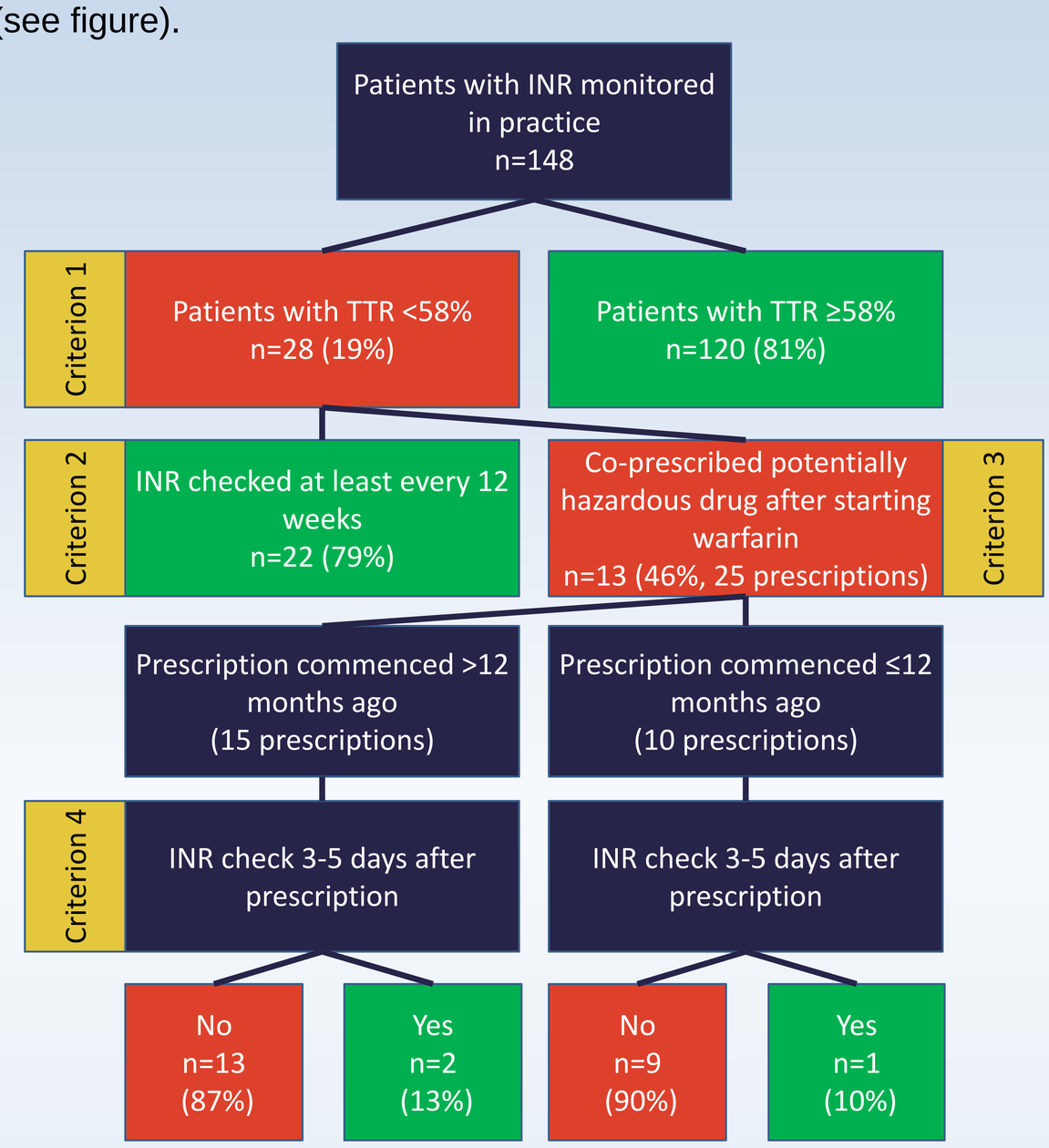
Results

Of the c.11,000 practice population, 148 patients have anticoagulation monitoring in practice

None of the standards regarding proportion of patients with adequate TTR nor adequate INR monitoring following prescription of potentially hazardous drugs were reached, though all patients with TTR <58% did have INR monitoring at least every 12 weeks (see figure).



Discussion

Although the practice achieves reasonably high levels of patients with a TTR ≥58%, it did not achieve the arbitrary standard of 90%.

A low proportion of patients had an INR check within the recommended 3-5 days after commencing a potentially hazardous drug in combination with warfarin. Although there is some variance in the interval within which an INR should take place, the 3-5 days advised by the CKS seems reasonable (though the National Patient Safety Agency advises 4-7 days[5]).

In order to improve the monitoring of patients receiving potentially hazardous drugs, and by extension to try to improve the proportion of patients with optimum TTR, the following actions should be implemented:

- Prompts on the Vision system (electronic reminders)
- Raise awareness at a primary care team meeting
- Promote anticoagulation e-learning modules for clinical continuing professional development
- Complete the audit cycle in 12 months to assess the effect of these interventions

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