Suboptimal anticoagulant management in patients after hospital initiation of warfarin

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In 1992, adverse events from warfarin use in Australia were estimated at more than $100 million annually in direct hospital costs alone.[1] The risk of bleeding associated with warfarin is highest early in the course of therapy.[2]

In 2000, we commenced a randomised, controlled trial to improve this.[3] The 68 patients randomised to usual care were managed by their general practitioner in the normal way. This provided an opportunity to examine anticoagulation management in current routine clinical practice. They received an extra visit 8 days after discharge to measure anticoagulant control.

Results

Most patients were elderly (40% were aged over 75 years, median age and range were 72.5 years and 20–91 years, respectively) and had a median of four chronic medical conditions. Less than half of the patients had a therapeutic international normalised ratio (INR) at discharge and 8 days later (*Table 1*).

There was excessive anticoagulation in one-quarter of the patients at day 8, although there were no adverse clinical outcomes detected (*Table 2*).

Table 1. Anticoagulant control at discharge and at day 8 after discharge

	n (%)	
	Control at discharge % (n=66*)	Control at day 8 % (n=63*)
Subtherapeutic	31 (47)	21 (33)
Therapeutic	30 (45)	26 (41)
Supratherapeutic	5 (8)	16 (26)
Total	66	63

* Some patients had no INR measured at discharge, others were re-admitted before day 8

Table 2. Clinical outcomes

- Mrs PE was discharged on 3 mg warfarin per day with an INR of 2.0. Her GP obtained an INR of 1.8 on day 2 after discharge and asked her to alternate 3 and 4 mg on alternate days. The patient misunderstood this to mean 3 mg in the morning and 4 mg at night on the same day. Her INR on day 5 after discharge was >8. A further complication was the GP's inability to contact her and she continued the double doses until day 7 when her warfarin doses were withheld for 2 days. Her INR on day 8 was still 7.6
- Mr MN was initiated on 5 mg of warfarin on the day of discharge. His INR on day 2 after discharge was 1.4 and the dose was increased to 7.5 mg per day. His INR when visited at day 8 was 4.8; he had received no further testing by his GP
- Mr AT was discharged on warfarin 1 mg per day with an INR of 4.0 and asked to follow up with his GP on day 3 after discharge. But his GP ordered no INR test. His INR when visited at day 8 was 1.2 on the same dose
- Mr RS was discharged on 5 mg warfarin per day with an INR of 1.7. His INR on day 1 after discharge was 1.8 and his GP increased his dose to 6 mg per day. His INR on day 4 was 3.2 and the dose was reduced to 5 mg per day. His INR when visited at day 8 was 4.8

Discussion

The trend to early discharge for hospital patients may be putting strain on the primary care system.[4] We found only 45% of patients had a therapeutic INR at discharge, compared to 63% in a previous audit in 1994 at the same hospital.[5]

There may be similar causes for poorly controlled anticoagulation after discharge: insufficient communication between hospital and GPs,[6] GPs extending the interval of monitoring too early, and GPs increasing dosages too quickly. Patients often need clear instructions about INR testing, and systems must ensure that INR

results are seen and acted upon.[7] Too many patients have so poorly a planned hospital discharge that their GPs are not fully informed.[4,6,8–10] Hospitals must take an active role in the timely and accurate transfer of information regarding warfarin doses and INR values to GPs.

Conflict of interest: none.

Implications of this study for general practice

- Early discharge of hospital patients commenced on warfarin may place pressure on general practice.
- Less than half the patients had INRs in the therapeutic range at discharge and 8 days later.
- A quarter had excessive anticoagulation 8 days later.

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