

Validation of a method to establish practice-based stroke and TIA registers

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SUMMARY

This study compares two methods to establish stroke and transient ischaemic attack (TIA) practice-based registers, which are of particular relevance to practices with limited diagnostic coding. Both arms involved a notes review of all patients taking antiplatelets or anticoagulants, and, either a further notes review of all patients with ischaemic heart disease (IHD) or diabetes (extensive arm), or asking about a history of stroke or TIA during IHD or diabetic clinics (pragmatic arm). The extensive arm involved searching 11% of the practice notes, whereas the pragmatic arm only involved 3% and had almost as high a yield. This study suggests that the pragmatic method could be used to help build practice-based stroke and TIA registers.

Keywords: cerebrovascular accident; medical records; transient ischaemic attack.

Introduction

PRIMARY care teams in the United Kingdom (UK) are required by April 2004 to have registers of patients who have had, or are at high risk of, stroke.¹ This is further emphasised by the new general practitioner (GP) contract.² Methods to identify patients with a history of stroke have recently been published,³ and this study adds to these by reporting a comparison of the yield and costs of two different but overlapping methods for searching GP computerised records, which does not rely on the previous recording of stroke on GP computer systems and may be particularly relevant to practices who have limited disease coding.

Method

After an initial pilot analysis in two practices, a targeted review of the notes of patients with a computer record of ischaemic heart disease (IHD), diabetes, or treatment with antiplatelets or anticoagulants showed promise. Other data, such as antihypertensive therapy, digoxin, atrial fibrillation, and hypertension, added little value.

Twelve out of thirteen (92%) practices from a mixed urban and semi-rural locality-wide personal medical services (PMS) pilot, covering a total population of 80 839 (all ages), agreed to participate. They were alternately allocated in decreasing population size into either the 'extensive' ($n = 6$) or 'pragmatic' ($n = 6$) arm (Figure 1).

In both arms, computer searches identified patients receiving repeat prescriptions of anticoagulants or antiplatelets. Patients with IHD or diabetes were excluded at this stage. Trained practice nurses or administration staff used an explicit protocol to review the paper notes of these patients and recorded a clinical diagnosis of stroke or transient ischaemic attack (TIA) if confirmed by imaging, or clearly written in a hospital letter. If there was uncertainty, the notes were reviewed by the GP.

In the extensive arm, a further search for patients with IHD or diabetes was followed by a review of their notes. In the pragmatic arm, clinicians running routine IHD or diabetic clinic reviews recorded whether they asked the previously validated question⁴ 'Have you ever had a stroke or TIA?' over the following 12 months. The diagnosis was determined with reference to medical records using the same protocol as above.

Odds ratios were calculated to compare the results for patients aged 50–99 years (given the low prevalence in patients under 50 years old), using the Mantel-Haenszel method adjusting for age and sex.

Results

The extensive method identified 4274 (11.1%) notes for review; 464 (1.2%) were thought to have had a stroke. The

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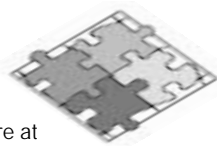
HOW THIS FITS IN

What do we know?

General practices are required to have registers of patients who have had, or are at risk of, stroke by April 2004. Published methods to identify patients with a past history of stroke include reviewing stroke recording on general practitioner (GP) computer systems, using hospital episode statistics and asking patients.

What does this paper add?

Performing a targeted notes review on patients who are taking anticoagulants or antiplatelets, or who have ischaemic heart disease (IHD) or diabetes produces a high yield but is costly in terms of the number of notes that need searching. Performing a targeted notes review on patients who are taking anticoagulants or antiplatelets, excluding those with IHD and diabetes, and asking about a past history of stroke or transient ischaemic attack in IHD and diabetic clinics has almost as high a yield at lower cost.



pragmatic method identified 1281 (3.0%) notes for review, and following a year of IHD and diabetic clinics, 425 (1.0%) were thought to have had a stroke, although only 65.6% of patients with IHD or diabetes were asked if they had a history

of stroke or TIA (Table 1). A comparison of these rates gave a pragmatic:extensive odds ratio of 0.82, 95% confidence interval (CI) = 0.72 to 0.93, $P = 0.003$. When the rates for TIA were included, there was no significant difference in the prevalence rates identified (adjusted odds ratio = 0.93, 95% CI = 0.84 to 1.02, $P = 0.14$).

The adjusted odds ratios comparing the estimated prevalence in the extensive and pragmatic arms to an expected stroke prevalence rate based on high quality local data⁵ were: 0.71 (95% CI = 0.57 to 0.89, $P = 0.029$) and 0.60 (95% CI = 0.48 to 0.75, $P < 0.001$), respectively. One practice in the pragmatic arm failed to follow the protocol correctly and did not record whether they had asked the question about a past history of stroke during their IHD or diabetic clinics. The adjusted odds ratio of the pragmatic:expected stroke prevalence rate was increased to 0.64 (95% CI = 0.50 to 0.80, $P < 0.001$) if this practice was excluded from the results.

Discussion

Both methods captured a high proportion of patients with a history of stroke or TIA, although the pragmatic method had a lower yield. The increased yield in the extensive arm was at the cost of reviewing an additional 8% of practice notes, whereas the pragmatic arm had a minimal additional oppor-

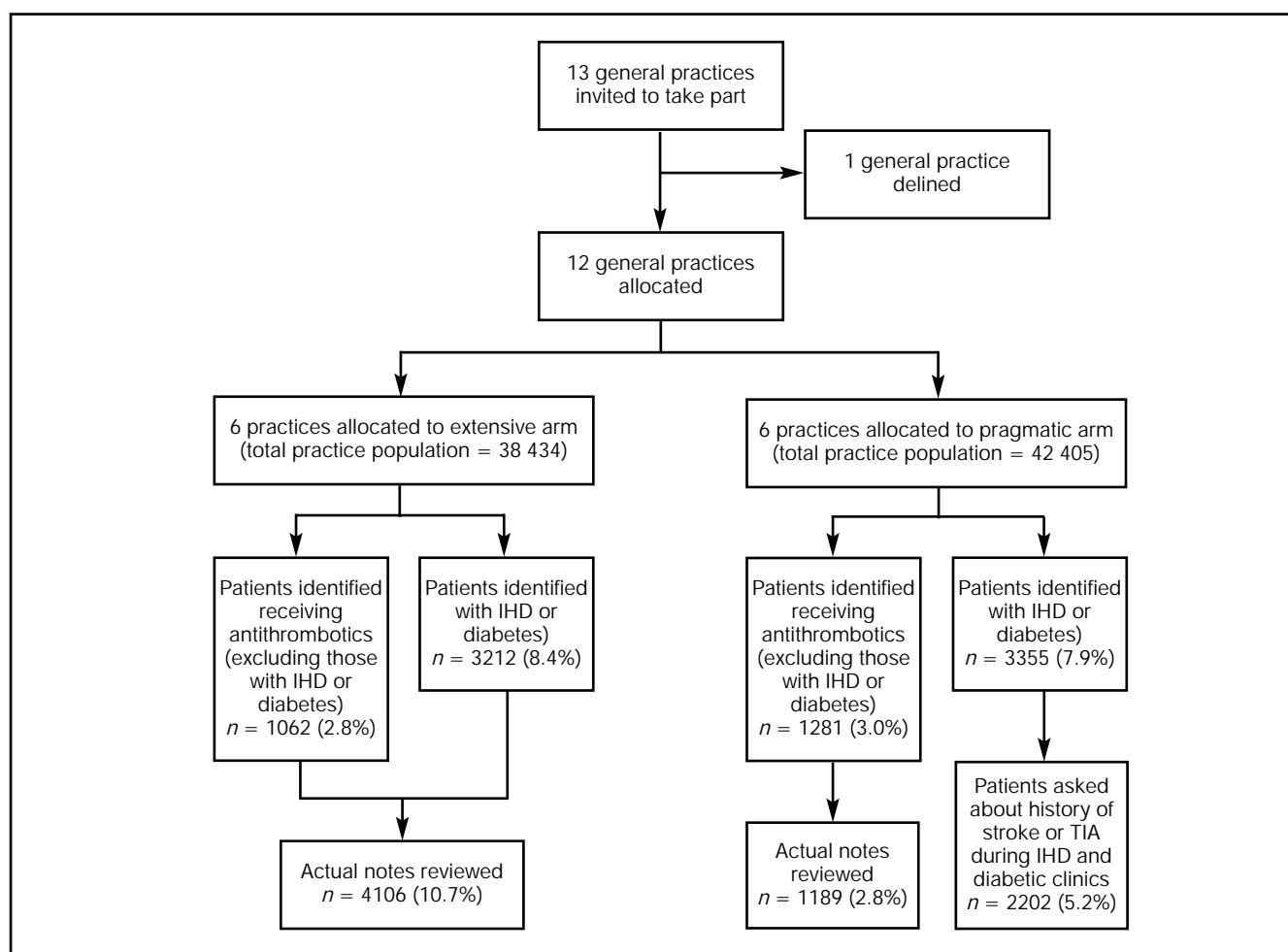


Figure 1. Methods and costs of the two arms.

Table 1. Number of notes identified for a targeted review and proportions with a positive diagnosis.

	Patients receiving antithrombotics excluding IHD and diabetes	Patients with IHD or diabetes ^a	Total	Prevalence rate per 1000 (95% CI)
Extensive method (<i>n</i> = 38 434)				
Notes identified to be reviewed (% of total)	1062 (2.8)	3212 (8.4)	4274 (11.1)	
Actual number reviewed (%)	1015 (95.6)	3091 (96.2)	4106 (96.1)	
Number with stroke (%)	197 (18.5)	267 (8.3)	464 (10.9)	12.1 (11.0 to 13.2)
Number with TIA (%)	166 (15.6)	209 (6.5)	375 (8.8)	9.8 (8.8 to 10.8)
Number with stroke or TIA (%)	323 (30.4)	426 (13.3)	749 (17.5)	19.5 (18.1 to 20.9)
Pragmatic method (<i>n</i> = 42 405)				
Notes identified to be reviewed (% of total)	1281 (3.0)	3355 (7.9)	4636 (10.1)	
Actual number reviewed (%)	1189 (92.1)	2202 (65.6)	3391 (73.1)	
Number with stroke (%)	236 (18.4)	189 (5.6)	425 (9.2)	10.0 (9.1 to 11.0)
Number with TIA (%)	221 (17.3)	171 (5.1)	392 (8.5)	9.2 (8.4 to 10.2)
Number with stroke or TIA (%)	419 (32.7)	313 (9.3)	732 (15.8)	17.3 (16.0 to 18.5)

^aDiagnosis of stroke or TIA assessed during IHD and diabetic review clinic in pragmatic arm. IHD = ischaemic heart disease; CI = confidence interval; TIA = transient ischaemic attack.

tunity cost of asking during clinics.

There were some limitations to this study. The searches may not initially identify those patients most in need; that is, those who are not on antithrombotic therapy but who might benefit from it or those who are not receiving regular review through structured IHD or diabetic clinics. However, the register produced is a useful baseline on which to build, and it can be used to deliver stroke-specific secondary and tertiary prevention. The estimate of capture by comparison with published (albeit local) data is limited. Ideally, the gold standard would have been a robust method of identifying all patients with stroke in the same population, but this would have required extensive population-based screening. The searches used criteria that were independent of previous computerised recording of stroke or TIA and therefore, when applying the method in practice, it would be pragmatic to first identify known patients with stroke or TIA (for example, by searching for relevant diagnostic Read codes). It is likely that using our method would be more beneficial in practices where the diagnostic recording of stroke on GP computer systems was limited.

Nonetheless, this study suggests that the pragmatic method has promise for creating a practice-based stroke register, although clearly this will need to be supplemented by other methods, including prospective diagnostic recording and opportunistic review of patients in surgery, in order to maintain the practice register.

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