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Patients' use and knowledge of aspirin in preventing vascular disease

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Aspirin is an effective means to prevent recurrence and death in patients with vascular disease. However, the extent to which patients are aware of this is not known. The objective of the study was to compare the use and knowledge of prophylactic aspirin between patients on repeat cardiovascular drug prescriptions and their matched controls. A cross-sectional survey of 600 patients was carried out in a group general practice. The subjects included 200 patients on repeat cardiovascular drug prescriptions (vascular group), and two age–sex matched groups: patients on other repeat prescriptions (nonvascular group) and patients not on repeat prescriptions (control group), sampled from the practice register. Use and knowledge of prophylactic aspirin were the main outcome measures. Aspirin knowledge was 72% in the vascular group; 53% in the nonvascular group, and 58% in the control group. Apart from patients who reported possible contra-indications to aspirin, 77% of patients with repeat cardiovascular drug prescriptions reported using aspirin regularly compared with 16% and 9% in the nonvascular and control groups, respectively. Amongst patients on repeat cardiovascular drug prescriptions, aspirin knowledge was the strongest predictor of aspirin use. To conclude, use of prophylactic aspirin in one practice was appropriate and had overcome the usual socio-demographic barriers to preventive activity. However, there were still significant numbers not using it. Increased usage in patients with vascular disease could be achieved by improving public knowledge of the benefits of prophylactic aspirin.

Key words: aspirin; coronary disease prevention; cross-sectional study; vascular disease

Introduction

Aspirin has become established as an important item in the secondary prevention of mortality and morbidity in people with symptomatic vascular disease (Antiplatelet Trialists' Collaboration, 1994), and evidence is also emerging of its potential value in asymptomatic high risk groups (Medical Research Council, 1998).

One potential barrier to the full implementation of a policy for aspirin use in primary care is poor knowledge or conflicting attitudes on the part of those patients who might benefit. Most studies of knowledge and attitudes about vascular disease prevention have focused on lifestyle or risk factors, about which people from lower socio-economic groups have generally poorer knowledge (Fleetwood and Packa, 1991; Holloran *et al*., 1993; Nourjah *et al*., 1994). Activities such as blood pressure and cholesterol checks are characteristically more frequent in the higher socio-economic groups (Fleetwood and Packa, 1991). Yet the incidence and mortality rates of cardiovascular disease are higher in lower social class groupings. Even where there is knowledge, there may be a reluctance to initiate change (Holloran *et al*., 1993). It is not known whether such factors also influence the use of aspirin for secondary prevention of cardiovascular disease.

Given that aspirin is such a simple intervention and that it does not require a prescription, patient

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awareness should help to drive it high on the agenda and to achieve targets of high coverage. However, for this to happen, it is important that we establish current knowledge and attitudes, in order to inform the design and evaluation of interventions to increase uptake.

We have therefore carried out a survey of use and knowledge about aspirin in different groups of general practice patients.

Methods

The setting was a single urban group general practice in North Staffordshire with a registered list size of 14000 patients. The design was a cross-sectional survey. The practice is part of the North Staffordshire GP Research Network. The network has well validated systems of computerized morbidity recording: each practice uses the Egton Medical Information computer System (EMIS), and the network carries out six month audits of data recording quality in the practices. Included in this, to ensure the validity of using particular drugs to identify specific medical conditions, is a cross check of medication against Read codes for that condition. This computerized recording therefore allows identification of disease groups through both morbidity registers and specific drug searches. In this case, only medications that would be specifically used in vascular disease were employed in the searches, for example nitrates in oral or transdermal formulation and Nicorandil. The study population consisted of three groups of patients:

- **Group 1**. 200 patients sampled randomly, using random number tables, from all those patients identified as currently using cardio-active drugs on a regular basis, aged between 45–74 years. This procedure was based on the computerized repeat prescription information held in the practice.
- **Group 2**. 200 patients sampled, by age and sex frequency matching to those in Group 1, from all patients with repeat prescriptions for drugs other than cardio-active compounds. Again the computerized repeat prescription system provided the sampling frame for this group.
- **Group 3**. 200 patients, frequency matched by age and sex to those in Group 1, sampled from the age/sex register of the practice, after excluding any patients who were receiving repeat prescriptions.

A postal questionnaire was developed mostly using questions previously tested in earlier surveys from the Centre, from the North Staffordshire Health Authority or from the Office of National Statistics (ONS). The first part concerned general health and demography. Social class was determined from current occupation, or most recent if unemployed or retired, using the Registrar General's classification (Office of National Statistics, 1991). Employment status (working/not working) was considered separately. Physical activity was assessed by a checklist of activities and the number of hours spent on these activities in total per week. In addition a new question asked subjects whether they felt themselves to be 'at risk' of future coronary events. The second part of the questionnaire focused on current use of aspirin and knowledge about the reasons for its use. Aspirin knowledge was based on a checklist of seven items, which asked about potential benefits and risks of using aspirin in relation to a range of specific physical health items, including angina, asthma, stroke, stomach ulcers, heart attack, poor circulation and allergy to aspirin (see Appendix 1). If more than half of the responses in the knowledge section were in agreement with what are regarded as 'correct' answers (*tick* next to 'Angina', 'Stroke', 'Heart attack', 'Poor circulation' and no *tick* for 'Asthma', 'Stomach ulcers', 'Allergy to aspirin'), the patient was arbitrarily defined as having knowledge of aspirin use (a subject *ticking* 'None of these' was considered as having 'no aspirin knowledge' as less than 50% of the answers would be 'correct'). Subjects suffering from a stomach ulcer, aspirin allergy, anti-coagulation therapy or clotting disorder were recorded as having potential contraindications to aspirin use. Finally, a checklist of potential sources of information about aspirin was included, and patients were asked to indicate whether they had learned anything from each of these sources. The questionnaire was piloted in a sample of practice patients to establish its comprehensibility and the completeness of responses to the individual items. It was then mailed to all subjects selected in the three study groups.

Univariate analysis was based on comparisons of frequencies by chi-square tests. Multivariate

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logistic regression was used to explore independent associations with aspirin knowledge. All statistical tests were assigned a significance level of 0.05, and data analysis was carried out using SPSS version 9.0.

Results

There were 600 questionnaires mailed, 200 to each of the three groups (vascular, nonvascular and controls). Overall 470 questionnaires were returned, a response of 78.3%. Response was highest in the vascular group (86%), lower in the other two groups (nonvascular: 79%, nonprescription controls: 70%).

Differences between the three groups in demographic characteristics, as ascertained by the questionnaire, are summarised in Table 1. There were more individuals in the vascular group who were no longer working or who were in social class IV or V. As might be expected, the cardiovascular risk profile was different in the three groups. There was more likely to be a family history of vascular disease reported by those in the vascular group, who also had a higher average body mass index and a lower proportion who took physical activity for more than three hours each week. The largest difference was in the proportions feeling more 'at risk'of a vascular event (85%, 27% and 14% in the vascular, nonvascular and control groups respectively).

A total of 105 patients in the vascular group (61%) were using aspirin (see Table 2). A small proportion in the other two groups were also using it regularly (13% and 9% in nonvascular and control groups respectively). A predictor of use in these two groups was a reported sense of being at risk of a cardiovascular event. After excluding 84 individuals with one of four potential contraindications to aspirin use, these figures were 77%, 16%, and 9% respectively. A small number, seven

Table 1 Summary of group characteristics

Type	Factor	Category	On repeat prescription		
			Vascular (n = 172)	Nonvascular (n = 158)	Control (n = 140)
Demographic factors	Age	≤65 years	68 (40)	81 (51)	67 (48)
		>65 years	104 (60)	77 (49)	73 (52)
	Gender	Male	92 (54)	78 (50)	59 (42)
		Female	79 (46)	79 (50)	80 (58)
	Marital status	Married	120 (71)	107 (68)	104 (75)
		Not married	50 (29)	50 (32)	35 (25)
	Social class[a]	I & II & III	52 (34)	62 (45)	69 (53)
		IV or V	101 (66)	77 (55)	61 (47)
	Employment status[a]	Not at work	158 (92)	115 (74)	89 (64)
		Working	13 (8)	41 (26)	50 (36)
Genetic factor	Family history[a]	No	46 (31)	82 (59)	69 (64)
		Yes	102 (69)	57 (41)	39 (36)
Behavioural factors	Diet	Poor	48 (31)	62 (42)	49 (37)
		Good	109 (69)	85 (58)	83 (63)
	BMI[a]	≤25	73 (46)	74 (48)	87 (64)
		>25	85 (54)	80 (52)	48 (36)
	Smoke	No	138 (80)	123 (78)	106 (76)
		Yes	34 (20)	34 (22)	34 (24)
	Physical activity[a] (per week)	≤3 hours	102 (65)	69 (50)	33 (27)
		>3 hours	55 (35)	68 (50)	88 (73)
Psychological factor	Feels at risk[a]	No	23 (15)	93 (73)	89 (86)
		Yes	126 (85)	34 (27)	14 (14)

Numbers are frequency counts (percentages in parentheses). Frequency counts do not always add to totals due to some msising data.
[a] $p < 0.05$ (by χ^2 test with 2 degrees of freedom).

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Table 2 A comparison of aspirin knowledge and aspirin use between groups

		Group		
		Vascular	Nonvascular	Control
Aspirin use	Total number, *including* contraindications[b]			
	No. on Apririn	105	21	12
	% on Aspirin	61.4	13.4	8.6
	95% CI for %	(54.1, 68.7)	(8.1, 18.7)	(4.0, 13.3)
	Total number, *excluding* contraindications[b]			
	No. on Apririn	99	20	12
	% on Aspirin	77.3	16.0	9.2
	95% CI for %	(70.1, 84.6)	(9.6, 22.4)	(4.3, 14.2)
Aspirin knowledge	Overall knowledge[b]			
	No. with knowledge	123	84	80
	% with knowledge	71.9	53.2	57.6
	95% CI for %	(65.2, 78.7)	(45.4, 60.9)	(49.3, 65.8)
	Risks[a]			
	Asthma	150 (96.8)	131 (98.5)	126 (99.2)
	Stomach ulcers	154 (99.4)	132 (99.2)	126 (99.2)
	Allergy to aspirin	153 (98.7)	132 (99.2)	127 (100)
	Benefits[a]			
	Angina[b]	73 (47.1)	40 (30.1)	29 (22.8)
	Stroke	38 (24.5)	32 (24.1)	32 (25.2)
	MI	79 (51.0)	58 (43.6)	60 (47.2)
	Poor circulation	52 (33.5)	42 (31.6)	34 (26.8)

[a]Number (percentage) of patients with 'correct answers' to individual items of the composite knowledge screening tool.
[b]$p < 0.05$ (by χ^2 test with 2 degrees of freedom).

individuals, were taking aspirin in the presence of a potential contra-indication.

Knowledge of aspirin and its advantages and disadvantages was more evenly spread between the three groups: 72%, 53% and 58% for vascular, nonvascular and controls respectively (see Table 2). Knowledge levels were better in all groups for the risks of aspirin use than for the benefits. Table 3 summarizes the associations of various characteristics with aspirin knowledge. Being on a repeat prescription of a cardiovascular drug, having a positive family history, and eating a 'healthy' diet, were all associated with higher levels of aspirin knowledge, but demographic and socio-economic characteristics were not.

Within the vascular group, a crude analysis illustrates that knowledge of aspirin prophylaxis was the strongest predictor of aspirin use (see Table 4). Most information about aspirin use in the vascular group was reported by participants as having been obtained from health professionals, particularly the general practitioner (55%) and the hospital specialist (43%). Within the nonvascular and control groups the media, friends and relatives were reported to be the more important sources of such information.

Discussion

This study found that most subjects in one general practice who were on repeat prescriptions for cardiovascular drugs were also using aspirin regularly. However a substantial number were not doing so, and despite some of them having potential contra-indications, it is likely that most could have been using aspirin beneficially. Nationally, in Britain, it is considered that there is under utilisation of aspirin for secondary prevention (McCallum *et al*., 1997).

Use of aspirin was higher in this 'vascular' group compared with two other groups of patients,

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Table 3 Associations with aspirin knowledge, summarized by odd ratios

		Aspirin knowledge		
		No.	%	OR (95% CI)
Age	≤65 years[a]	150	69.1	1.0
	>65 years	138	54.8	0.98 (0.50, 1.91)
Gender	Female[a]	148	62.4	1.0
	Male	139	60.7	0.68 (0.38, 1.23)
Marital status	Not married[a]	75	56.0	1.0
	Married	211	63.7	1.52 (0.79, 2.92)
Social class	I & II & III[a]	124	67.4	1.0
	IV & V	146	61.3	0.78 (0.44, 1.41)
Employment status	Not working[a]	211	58.4	1.0
	Working	75	72.1	1.70 (0.77, 3.79)
Family history	No[a]	111	56.1	1.0
	Yes	138	69.7	2.40 (1.24, 4.65)
Diet	Poor[a]	79	50.0	1.0
	Good	196	70.5	2.20 (1.22, 3.96)
BMI	≤25[a]	137	58.8	1.0
	>25	139	65.3	1.00 (0.55, 1.84)
Smoke	No[a]	229	62.2	1.0
	Yes	59	59.0	0.87 (0.43, 1.75)
Physical activity (per week)	≤3 hours[a]	115	56.7	1.0
	>3 hours	136	64.2	1.41 (0.77, 2.59)
Feelings of risk	No[a]	118	57.3	1.0
	Yes	122	70.1	0.78 (0.35, 1.76)
Group	Control[a]	80	57.6	1.0
	Nonvascular	84	53.2	1.45 (0.70, 2.98)
	Vascular	123	71.9	3.10 (1.21, 7.90)

[a]Reference category.
Odds ratios are adjusted for all the other factors in the table.

one a group who were receiving repeat prescriptions for noncardiovascular drugs, and the other an age and sex matched sample of the population who were not on repeat prescriptions. The fact of being on a repeat prescription for cardiovascular drugs was more important in predicting aspirin use than demographic or lifestyle characteristics, although in our survey the latter was limited to global measures only rather than specific validated criterion. This suggests that socio-demographic barriers which have been described in relation to lifestyle approaches to coronary prevention (Fleetwood and Packa, 1991; Osler *et al*., 1992; Reynes *et al*., 1993; Nourjah *et al*., 1994; Winkleby *et al*., 1994) can be overcome in the case of aspirin prophylaxis. Our definition of knowledge was arbitrarily defined without validation against any external measure of knowledge but it appeared that among those who were receiving repeat prescriptions for cardiovascular drugs, knowledge according to our construction was by far the strongest predictor of its use.

The largest difference between the vascular group and the two control groups was that 85% of those in the vascular group felt 'at risk' compared with 27% and 14% in the nonvascular and control groups respectively. However those who reported using aspirin in the two control groups were more likely to have feelings of being at risk, and so, even in the absence of a clear cardiovascular indication for aspirin use, perception of risk appears to influence aspirin use. This reflects evidence from the literature that perceived personal risk influences health-related behaviours (Mirotznik *et al*., 1995; Meischke *et al*., 1999).

The figure for the proportion of people who reported using aspirin in the nonvascular and control groups has a number of possible implications. Firstly, it can be taken as a potential estimate of 'inappropriate therapy', since those who reported

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Table 4 Predictors of aspirin use[b] in the vascular group only

		Aspirin use		
		No.	%	OR (95% CI)
Age	≤65 years[a]	40	81.6	1.0
	>65 years	59	74.7	0.66 (0.27, 1.61)
Gender	Female[a]	42	71.2	1.0
	Male	56	82.4	1.89 (0.82, 4.38)
Marital status	Not married[a]	24	63.2	1.0
	Married	74	83.1	2.88 (1.22, 6.81)
Social class	I & II & III[a]	32	82.1	1.0
	IV & V	60	78.9	0.82 (0.31, 2.20)
Employment status	Not working[a]	86	75.4	1.0
	Working	12	92.3	3.91 (0.49, 31.4)
Family history	No[a]	31	88.6	1.0
	Yes	59	76.6	0.42 (0.13, 1.36)
Diet	Poor[a]	27	77.1	1.0
	Good	67	79.8	1.17 (0.45, 3.02)
BMI	≤25[a]	39	78.0	1.0
	>25	54	81.8	1.27 (0.51, 3.17)
Smoke	No[a]	79	78.2	1.0
	Yes	20	74.1	0.80 (0.30, 2.12)
Physical activity (per week)	≤3 hours[a]	55	74.3	1.0
	>3 hours	35	83.3	1.73 (0.66, 4.53)
Feelings of risk	No[a]	15	71.4	1.0
	Yes	72	80.0	1.60 (0.54, 4.70)
Aspirin knowledge	No[a]	4	18.2	1.0
	Yes	95	89.6	38.9 (11.1, 136)

[a]Reference category.
[b]The figures exclude contraindications to aspirin use.

using aspirin in these groups did not have a diagnosis of vascular disease recorded on the computer. If the figure is taken as a reasonable estimate of the general use of aspirin in 45–74 years olds in the population, then this relatively low percentage could be viewed as reassuring rather than otherwise. This takes account of current guidelines for aspirin use which suggest that it is not particularly effective when used in the absence of symptomatic vascular disease (Peto *et al*., 1988; Steering Committee of the Physician's Health Research Group, 1989), although this advice may change in the light of the latest evidence (Medical Research Council, 1998). Since aspirin does have potential side effects, the concern is that many people in the population taking aspirin unnecessarily might generate a significant number of such effects. From this point of view the baseline percentages of aspirin use reported in the two control groups can be taken to represent an estimate of the 'spill over' effect of media, medical or practice information which was likely to have influenced our study population. Future research might usefully explore further the role that 'feelings of risk' might play in influencing such behaviour.

Response rates were reasonable but the possibility of nonresponse bias must be allowed for in our estimates. In particular it may well be that those who did not respond to the questionnaire in the vascular group (14% of those mailed in group 1) were those who also were not using or were not aware of aspirin use. This would imply that potential for improved use and knowledge is larger than we have estimated. The other potential cause for concern is information bias, in particular the validity of self-reported aspirin use. However we validated this question in 60 patients by (i) test–retest repeatability and (ii) checking whether actual medication use from a tablet count was consistent with self-reported use.

Our general conclusion is that knowledge about aspirin prophylaxis was widespread in this parti-

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cular general practice population and was linked with appropriate use. Among patients who are receiving treatment for cardiovascular diseases, this knowledge might have been gained as a result of being prescribed or advised to use the drug. However the finding that knowledge was associated with appropriately low levels of aspirin use in the two control groups suggests also it does importantly precede and influence actual use. Given the significant minority of patients with cardiovascular disease who are not on aspirin and who are unaware of its importance, policies directed at improving knowledge in this group might lead to better levels of use and further reductions in cardiovascular disease recurrence and complications.

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Appendix 1

Aspirin use and knowledge questions

How often do you take an aspirin?
(Please fill in a **number** or **tick** never)
[ ] per day
[ ] per week
[ ] per month
Never [ ]

Which of the following do you think is helped by taking an aspirin daily?
(Please **tick** as many as you feel are helped)
Angina [ ]
Asthma [ ]
Stroke [ ]
Stomach ulcers [ ]
Heart attack [ ]
Poor circulation [ ]
Allergy to aspirin [ ]
None of these [ ]

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