Medical audit

Variation in general practitioner referral of patients with arterial disease

SAJ Grimble, C Button, TR Magee, MH Lewis, RB Galland

Departments of Surgery, Royal Berkshire Hospital, Reading and Royal Glamorgan Hospital, Llantrisant, Mid-Glamorgan UK

Aim: To compare patterns of referral for arterial disease in two areas in the UK.

Methods: A postal questionnaire was used to survey general practitioner (GP) referral patterns for arterial disease. Questionnaires were sent to West Berkshire GPs in 1993 and 2000 and to Llantrisant GPs in 2000.

Results: A 70-year-old man with claudication at half a mile and an 80-year-old man with claudication at half a mile or 100 m were significantly more likely to be referred ($P < 0.001$) in West Berkshire in 2000 compared with 1993. This referral change also applied to an 80-year-old man with an aortic aneurysm who was more likely to be referred in 2000 ($P < 0.01$). Patients with gradual onset of rest pain were more likely to be referred urgently or as an emergency in 2000 ($P < 0.05$). When comparing the two areas in 2000, significant differences emerged in the likelihood of referring patients with intermittent claudication. Scepticism continues towards the value of AAA screening in West Berkshire with only about two-thirds of GPs thinking that it was of value. On the other hand in Llantrisant, 94% of GPs thought AAA screening was valuable ($P < 0.001$). There was a significant decrease in the number of GPs who felt that they would refer patients directly to a regional vascular centre in West Berkshire between the two time periods ($P < 0.001$). There was a difference in likelihood of referral to regional centres between the two areas in 2000 (33% versus 6%, $P < 0.001$).

Conclusions: Vascular referral patterns change with time and vary from one area to another. This has implications for planning vascular services.

Key words: General practice referrals – Arterial disease – Variation

In 1993, we carried out a postal questionnaire examining general practitioner (GP) referral patterns of patients with peripheral vascular disease.¹ Our results suggested a reluctance to refer many elderly patients with claudication or with asymptomatic abdominal aortic aneurysm (AAA). We suggested that increased awareness by GPs of minimally invasive methods of treatment or benefits of

AAA repair may have a considerable impact on quality of vascular patients care and vascular surgical workload.

The aim of the present study was to see whether any changes had occurred in likely arterial referrals between 1993 and 2000 in West Berkshire. We also wished to compare the results in West Berkshire with those obtained from another area of the UK.

Correspondence to: Mr RB Galland, Department of Surgery, Royal Berkshire Hospital, London Road, Reading RG1 5AN, UK

Table 1 Number and type of referrals

Type of patient/symptoms	No referral	Routine referral	Urgent referral	Emergency admission
60-year-old with claudication at half a mile	11 (14.5)	59 (77.6)	6 (7.9)	0
70-year-old with claudication at half a mile	40 (52.6)	36 (47.4)	0	0
80-year-old with claudication at half a mile	71 (93.4)	5 (6.58)	0	0
60-year-old with claudication at 100m	3 (4.1)	36 (48.6)	35 (47.3)	0
70-year-old with claudication at 100m	8 (10.8)	53 (71.6)	13 (17.6)	0
80-year-old with claudication at 100m	45 (60.8)	27 (36.5)	2 (2.7)	0
Sudden onset claudication 5 days previously	1 (1.3)	5 (6.6)	63 (82.9)	7 (9.2)
Sudden onset claudication <24 h previously	0	3 (3.95)	23 (30.3)	50 (65.8)
Gradual onset rest pain	4 (5.4)	40 (54.1)	27 (36.5)	3 (4.1)
Sudden onset rest pain 5 days previously	0	1 (1.3)	54 (70.1)	22 (28.6)
Sudden onset rest pain <24 h previously	0	0	10 (13.2)	66 (86.8)
80-year-old with asymptomatic abdominal aneurysm	34 (44.2)	35 (45.5)	8 (10.4)	0
Painful abdominal aortic aneurysm	1 (1.3)	11 (14.5)	36 (47.4)	28 (36.8)

n (% of respondents). Reading 1993.¹

Materials and Methods

West Berkshire serves a population of approximately 460,000. All elective vascular surgery is dealt with at the Royal Berkshire Hospital, Reading. Two general surgeons have a special interest in vascular surgery. The Royal Glamorgan Hospital, Llantrisant serves a population of 380,000 in South Wales. Two vascular surgeons deal with all elective and the majority of emergency vascular cases. It offers an aneurysm screening service and the vascular technician will offer local advice concerning vascular cases if so requested.

A total of 100 randomly selected general practitioners (GPs) in West Berkshire were sent a single page questionnaire asking the way in which they would refer various types of clinical condition to a vascular surgeon. They were also asked their opinion on the value of ultrasound screening for abdominal aortic aneurysms and whether they would refer patients directly to regional vascular centres. Questionnaires were sent to as many different practices as possible. We tried to survey equal numbers of senior and junior partners. The questionnaires were sent out in May 2000 and the results were compared with those from a similar questionnaire sent out in 1993.

The same questionnaire was sent to 125 randomly selected GPs who referred patients to the Royal Glamorgan Hospital.

Six weeks following the original posting, a second questionnaire was sent and GPs who had not responded to the first were asked to fill in the second questionnaire.

Statistical analysis was carried out using a chi-squared test.

Results

The results of the three surveys are shown in Tables 1–3. The response rate of the original questionnaire in 1993 was 77%.

Response rates of the West Berkshire and Llantrisant questionnaire in 2000 were 67% and 50% (63 of 125), respectively.

Intermittent claudication

Between 1993 and 2000, there was no change in the likelihood of a 60-year-old man with claudication being referred. However, GPs in West Berkshire were more likely to refer a 60-year-old man with claudication at half a mile than those in Llantrisant (chi-squared 5.3, df 1, $P < 0.05$). A 70- or 80-year-old man was more likely to be referred in 2000 compared with 1993 in West Berkshire (chi-squared 11.9, df 1, $P < 0.001$; chi-squared 20.8, df 1, $P < 0.001$, respectively). Similarly, an 80-year-old man with 100 m claudication was more likely to be referred in 2000 (chi-squared 42.9, df 1, $P < 0.001$). Although a 70-year-old man with claudication at half a mile was more likely to be referred in West Berkshire than Llantrisant (chi-squared 6.7, df 1, $P < 0.01$) there was no difference in the likelihood of an 80-year-old with either claudication distance being referred between the two districts.

In answer to the question concerning patients with sudden onset of claudication, most GPs would refer the patient urgently or as an emergency. There was no difference between referral patterns comparing the two areas.

Rest pain

Patients with rest pain were more likely to be referred as an urgent or emergency case in 2000 compared with 1993 in West Berkshire (chi-squared 4.8, df 1, $P < 0.05$). Virtually all patients with sudden onset of rest pain would be referred either urgently or as an emergency.

Table 2 Number and type of referrals

Type of patient/symptoms	No referral	Routine referral	Urgent referral	Emergency admission
60-year-old with claudication at half a mile	6 (9)	60 (90)	1 (1)	0
70-year-old with claudication at half a mile	16 (24)	50 (76)	0	0
80-year-old with claudication at half a mile	41 (62)	25 (38)	0	0
60-year-old with claudication at 100m	0	40 (60)	27 (40)	0
70-year-old with claudication at 100m	0	47 (70)	20 (30)	0
80-year-old with claudication at 100m	8 (12)	49 (73)	10 (15)	0
Sudden onset claudication 5 days previously	0	9 (14)	40 (61)	15 (25)
Sudden onset claudication <24 h previously	0	4 (6)	18 (29)	41 (65)
Gradual onset rest pain	1 (2)	26 (39)	37 (57)	2 (3)
Sudden onset rest pain 5 days previously	0	2 (3)	37 (57)	26 (40)
Sudden onset rest pain <24 h previously	0	0	15 (23)	50 (67)
80-year-old with asymptomatic abdominal aneurysm	9 (13)	43 (65)	11 (16)	3 (6)
Painful abdominal aortic aneurysm	0	0	7 (11)	57 (89)

n (% of respondents). Reading 2000.

Table 3 Number and type of referrals

Type of patient/symptoms	No referral	Routine referral	Urgent referral	Emergency admission
60-year-old with claudication at half a mile	15 (24)	45 (71)	2 (3)	1 (1.5)
70-year-old with claudication at half a mile	29 (46)	32 (51)	2 (3)	0
80-year-old with claudication at half a mile	41 (65)	20 (32)	0	0
60-year-old with claudication at 100m	1 (1.5)	33 (52)	28 (44)	0
70-year-old with claudication at 100m	4 (6)	42 (67)	16 (25)	1 (1.5)
80-year-old with claudication at 100m	13 (21)	40 (63)	10 (16)	0
Sudden onset claudication 5 days previously	2 (3)	5 (8)	41 (65)	15 (24)
Sudden onset claudication <24 h previously	2 (3)	5 (8)	20 (32)	35 (56)
Gradual onset rest pain	0	32 (51)	26 (41)	2 (4.7)
Sudden onset rest pain 5 days previously	0	0	40 (63)	23 (37)
Sudden onset rest pain <24 h previously	0	0	15 (24)	48 (76)
80-year-old with asymptomatic abdominal aneurysm	6 (10)	40 (63)	17 (27)	0
Painful abdominal aortic aneurysm	0	1 (1.5)	5 (8)	57 (90)

n (% of respondents). Llantrisant 2000.

Abdominal aortic aneurysms

In 1993, GPs in West Berkshire were undecided whether to refer an octogenarian with an AAA. However, they were more likely to refer in 2000 (chi-squared 15.7, df 1, $P < 0.01$). GPs in Llantrisant also felt that referral of patients over 80 years of age with AAA was worthwhile.

Virtually all painful AAAs were likely to be referred as emergencies or urgently. With regard to the value of screening for AAA (Table 4), West Berkshire GPs were no more in favour of it in 2000 than they had been in 1993 (chi-squared 0.3, df 1, NS). On the other hand, GPs in Llantrisant were significantly more in favour of screening (chi-squared 17.4, df 1, $P < 0.001$).

Referral to regional centre

Fewer GPs were likely to refer patients directly to a regional vascular surgeon in West Berkshire in 2000 compared either with West Berkshire in 1993 (chi-squared 13.4, df 1, $P < 0.001$) or Llantrisant (chi-squared 16.0, df 1, $P < 0.001$) (Table 5).

Table 4 GPs' opinion on value of AAA screening

Screening	West Berkshire 1993	West Berkshire 2000	Llantrisant 2000
Useful	47	44	59
Not useful	30	10	3
Don't know	0	13	0

Table 5 Likelihood of direct referral to regional vascular centre

	West Berkshire 1993	West Berkshire 2000	Llantrisant 2000
Yes	23	4	21
No	54	63	41

Discussion

There was a clear trend towards increased likelihood of patients being referred with intermittent claudication in West Berkshire over the two time periods. On the other hand, there was clearly a difference in the two areas in 2000. The main reason for investigating most patients with intermittent claudication would seem to be to exclude an associated AAA.² Most patients with claudication can be managed with an exercise class and correction of risk factors rather than any form of vascular intervention.³

Between 1993 and 2000 in West Berkshire, there was an increased likelihood of referring older patients. This may well be a reflection of the ageing population in this area.⁴ Furthermore, it has been shown that operating on carefully selected patients over the age of 80 years with AAA can produce satisfactory results in terms of postoperative mortality.⁵

AAA screening in Llantrisant has been carried out since 1992.⁶ This probably explains the fact that Llantrisant GPs are in favour of screening. Screening has been shown to reduce the incidence of aneurysm rupture and aneurysm-related deaths in screened compared with unscreened patients.⁷

Variation in activity in different vascular centres has been identified.⁸ A number of factors may be responsible for this. The numbers of arterial reconstructions and endovascular arterial procedures being carried out has risen dramatically in recent years. Tunis *et al.* noted that in the State of Maryland between 1979 and 1989 there was a doubling in the rate of peripheral bypass operations.⁹ There was a corresponding rise in the number of percutaneous transluminal angioplasties which were carried out. In those units carrying out both general and vascular surgery, the latter had increased compared with the former.¹⁰ Variations in activity have been identified between different hospitals, different regions of the same country and between different countries. In Denmark, ratios of observed to expected reconstruction rates ranged from 0.61 to 1.54.¹¹ In the Oxford region, we identified a general increase in the vascular activity carried out but noted major differences in the numbers of cases being performed in the different districts of the region.¹² Variations are not restricted to patients with arterial

disease. Similar variations are apparent when considering varicose vein operations.¹³

Population demographics may also be important in explaining variation. Vascular reconstruction has been shown to be 1.7 times more common in men than women and 1.6 times more common in black compared with white patients.¹⁴ Similarly, higher amputation rates have been identified in areas of the UK with high standard mortality and highest death rate from atheroma and ischaemic heart disease.¹⁵

The influence of GP referral patterns has not been examined in this context. Patterns in referral can certainly be influenced. Patient awareness and, therefore, referral can be influenced even by 'soap operas' on television.¹⁶ Similarly, the tendency towards more specialisation has meant that the majority of breast referrals are made to a breast surgeon rather than general surgeon.⁴ Surgeons themselves can influence GP referrals. We sent a data sheet to GPs regarding value of carotid endarterectomy and noted a significant increase in the numbers of patients referred.¹⁷ The introduction of open access duplex scanning for carotid artery disease has been shown to be associated with a large increase in both imaging and surgical workload.¹⁸

The provision of vascular services in the UK has been the subject of considerable discussion recently.¹⁹ GP attitude towards patients with arterial disease has implications for planning of future vascular services.

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