

Management of heart disease in the elderly in the Plymouth Health District

ABSTRACT—In the light of a report from the Royal College of Physicians, the management of heart disease in the elderly (> 70 years) was studied in the Plymouth Health District in 1992. A survey of general practitioners was undertaken to assess how they would handle particular aspects of heart disease in their elderly patients. The admissions of older patients to the coronary care unit following an acute myocardial infarction and their outcome were detailed. The numbers of non-invasive cardiological investigations undertaken in the elderly were monitored, as were the referral rates to a cardiology outpatient clinic. The overall conclusion is that physicians and general practitioners alike view coronary artery disease as a medical condition with little consideration of the surgical option, despite good evidence that elderly patients often do very well following coronary artery bypass grafting. Future resource planning should address the problem of an overburdened cardiac surgery service.

Heart disease is the single most important cause of death in elderly people. In addition, it is a major cause of disability and loss of independence in old age. A significant proportion of heart disease is potentially treatable.

In 1991, a working group of the Royal College of Physicians reported on cardiological intervention in elderly patients [1]. The report stresses that 'age alone does not necessarily diminish the benefits that result from appropriate treatment' [1], a sentiment echoed from the experience of cardiac surgery at Papworth Hospital [2]. It states the need for adequate non-invasive diagnostic facilities regardless of age, and that invasive cardiological investigation is indicated in patients who are fit for surgical intervention.

It is clearly important to discuss the basis on which to develop policy and agree the scale of provision which is appropriate [3]. A more recent publication of the Royal College of Physicians has taken the plight of elderly medicine further and has stressed most strongly the need for equity and quality of care for this age group [4].

These and similar reports [5,6] have led us to evaluate the management of heart disease in the elderly in

the Plymouth Health District and establish whether or not deficiencies exist.

Methods

Plymouth Health District

The Plymouth Health District provides all acute hospital services for a population of 429,225. The distribution of this population in terms of age, sex, and social class is very similar to the national average for England and Wales [7].

Patients

The patients in this study were admitted to the district coronary care unit (CCU), or reviewed in a specialist cardiological outpatient clinic, or underwent non-invasive cardiac investigations in the department of cardiology in Derriford Hospital, Plymouth, in 1992.

Assessment of general practitioner management

All general practitioners in this catchment area were included in the survey. We assessed their perception of cardiac disease in their elderly patients by presenting them with a postal questionnaire suggesting the four following cardiac scenarios in the 70-year-old-plus patient who had no other illnesses.

1. Deteriorating heart failure, aged 71.
2. Symptomatic aortic stenosis, aged 78.
3. Palpitations with an arrhythmia, aged 77.
4. Worsening and disabling angina, aged 75.

The options to be taken were: (a) not to refer but to continue management at home; (b) to refer for consultation to a general physician, or a geriatrician, or to a cardiologist. The questionnaire was signed by two members of the team (CJP and AJK) who had no obvious connection with the cardiology department to avoid influencing the response.

Outpatient clinic referrals

All new patients referred to one specialist cardiology clinic were assessed and final diagnoses analysed. This analysis could be used to assess whether the answers given by the GPs in the questionnaire were put into practice.

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Admissions to coronary care unit during 1992

The hospital notes of patients with a final diagnosis of acute myocardial infarction admitted to the CCU in Derriford Hospital, Plymouth in 1992 were analysed. The notes of a proportion of these patients aged over 65 years were studied retrospectively, with a follow-up of between 9 and 21 months, to ascertain whether they had a past history of ischaemic heart disease, whether they had previously been investigated, or if, indeed, the infarct had led to a more aggressive approach to management and intervention.

Non-invasive cardiological investigations

Echocardiograms, 24-hour ambulatory electrocardiograms, and exercise electrocardiography tests carried out in patients aged 70 years and over in the Plymouth cardiology department during the year 1992 were analysed. Their hospital notes were scrutinised to extract information concerning the reason for investigation, result of the test, and the outcome or change in management.

Results*GPs' perception of heart disease in the elderly: results of the postal survey*

We received 235 replies from a total of 248 general practitioners working in the Plymouth Health District (95% response rate). The distribution for the manage-

ment selected for each of the four cardiac conditions is shown in Fig 1. As a generalisation GPs viewed heart failure, aortic stenosis and arrhythmias in the elderly in a similar fashion: 10–30% would continue to manage any of these conditions at home, and 50–85% would be referred to hospital—these referrals being approximately equally divided between the geriatricians (30–40% of referrals) and the cardiologists (20–55%) with just a few patients coming in the direction of the general physicians (1–4%). However, the management profile for symptomatic ischaemic heart disease was completely different; 92% of GPs would continue medical therapy at home, and only 2% of patients would initially be referred; about 10% of GPs stated that they would often try to manage the patient themselves in the first place and then refer.

Outpatient clinic referrals

During 1992, 522 patients were newly referred to one cardiology clinic, 96 (19%) of whom were aged 70 years and over. We obtained 94 (97%) sets of their hospital notes from which we could make a final diagnosis: bradyarrhythmias in 47%, valvular disease in 31%, heart failure or cardiomyopathy in a further 31%, and angina in 19%.

Admissions to the coronary care unit

In 1992, 882 patients were admitted to the CCU at Derriford Hospital with the diagnosis of acute myocardial infarction; 583 patients (61%) were aged 65

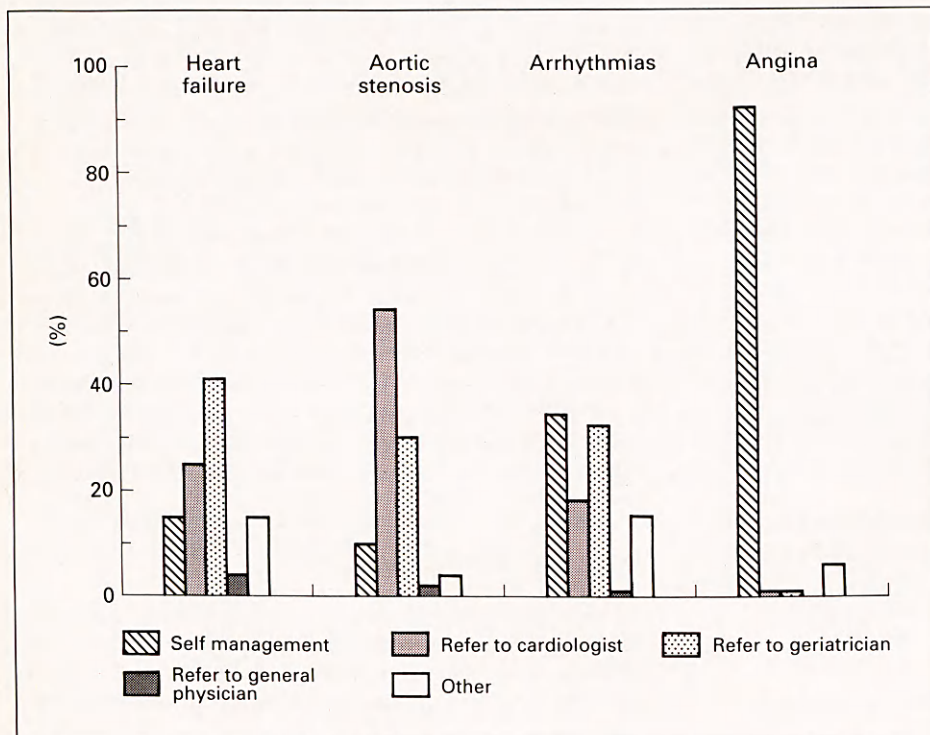


Fig 1. Potential management by general practitioners of cardiac conditions in the elderly: results of postal questionnaire

years or over, and 388 patients (44%) were aged 70 years and over; of the latter 256 (66%) survived.

A subsequent retrospective review of 150 randomly selected notes of these patients over 65 years showed that 74 patients had a previously documented history of ischaemic heart disease, of whom 66 were actively symptomatic, and 51 patients were currently receiving anti-anginal medication. Only three had been previously investigated, leading to coronary bypass surgery for two and angioplasty for the third. Forty-five of these 150 patients suffered other significant medical conditions (including arthritis, diabetes, pulmonary problems, peripheral vascular disease) and 16 patients had medical problems which would exclude them from further investigations (eg carcinoma, dementia, cerebrovascular disease, alcohol-related disorders, general senility of old age).

The outcome of the 119 survivors from hospital was studied over a period of up to 21 months (Table 1). Fifteen patients died and eight more had a second myocardial infarction. A little over one-half (69 patients; 58%) were actively followed up in the outpatient clinic. Twenty-six patients (22%) were discharged from hospital care and lost to subsequent follow-up. Only one patient out of the total 150 initially studied in this group went on to receive the benefits of cardiac surgery.

Non-invasive cardiological investigations in the elderly

A total of 987 non-invasive cardiological investigations were requested and undertaken in the over 70-year-olds, of whom 901 (91%) were traced and included in the study (Table 2).

Echocardiograms: Of the 492 assessments, 255 (52%) were directed at ascertaining left ventricular function; 281 (57%) were to elucidate the significance of a valvular lesion or the origin of a cardiac murmur. Although a high proportion of patients (57%) showed significantly reduced or poor left ventricular function, 42% were reported as having reasonable or good left ventricular function (ie ejection fraction > 40%). Significant valvular lesions were present in 386 patients, of whom 35% showed significant mitral regurgitation, and 22% significant aortic stenosis (gradient > 60 mm Hg). Only six cases of bacterial endocarditis were suggested echo-cardiographically (out of 46 suspected) and seven of pericardial effusions were identified (out of 19 suspected). Significant intracardiac thrombus was identified in only one patient although 43 subjects were specifically investigated for this purpose. Echocardiograms as part of a cardiovascular assessment prior to elective general surgery were performed in 43 patients over the age of 70 years.

The overall outcome of this investigation was that of the 492 subjects who had echocardiograms, 88 patients (18%) had a change to their medical management (usually to initiate an ACE inhibitor). Where valvular

Table 1. Outcome of 150 patients, 65 years and over, admitted to the coronary care unit, with a diagnosis of myocardial infarction in Plymouth in 1992 (follow-up of 9–21 months).

Outcome	Number of patients	%
Died in hospital	31	21
Died in follow-up period	15	10
Reinfarct	8	5
Discharged from hospital care	26	17
Hospital clinic follow-up	69	46
Surgery	1	0.6

lesions were identified, 29 patients went for cardiac catheterisation, and 21 of them subsequently underwent valve replacement surgery.

24-hour ambulatory electrocardiograms: In 1992, 343 elderly patients had 24-hour ambulatory ECG recordings to investigate blackouts in 132 (38%), previously reported dizzy spells in 126 (37%), palpitations in 118 (34%), or because of previously recorded arrhythmias in 101 (29%). During recording, 145 (42%) patients reported symptoms (dizziness, palpitations): no blackouts occurred, although one patient died while wearing the Holter recorder.

Analyses of these tapes revealed 264 (77%) patients to be permanently in sinus rhythm, 46 patients (13%) in atrial fibrillation, and the rest showed significant intermittent arrhythmias. In the 145 patients reporting symptoms, only 60 rhythm abnormalities were demonstrated during these episodes. The overall outcome measures meant that 65 patients (19%) were started on anti-arrhythmic agents, or had their pre-existing medical treatment adjusted. Twenty pacing systems were implanted—11 permanent and 9 temporary; and three cardioversions were subsequently undertaken.

Exercise electrocardiography: Sixty-six exercise treadmill tests were conducted in our cohort of patients aged 70

Table 2. Non-invasive cardiological investigations analysed in elderly patients (70 years and over) in Plymouth Health District in 1992.

Investigation	Total patients investigated (all ages)	Elderly patients (> 70 years)	%
Total number of non-invasive cardiological investigations	3,547	901	25.8
Echocardiograms	1,662	492	29.6
24-hour electrocardiograms	900	343	38.1
Exercise electrocardiograms	985	66	6.7

and over. Most of them (83%) were referred for these tests directly by the cardiologists rather than from the geriatricians or general physicians.

The results demonstrated 28 ischaemic exercise ECGs with significant ST-segment depression (> 2 m); 32 exercise ECGs were negative, six were uninterpretable due to a left bundle branch pattern. Of the 28 patients with an ischaemic exercise tolerance test, 16 (57%) were referred for coronary angiography, of whom 6 (37%) later underwent coronary artery bypass graft surgery.

Discussion

Plymouth Health District

The population structure of this district is similar to that of the rest of England and Wales [7], with a relatively static population, although some seasonal variation does exist due to tourism. By comparison with national population statistics, the Plymouth Health District shows a slightly skewed elderly population in that 69,200 (16.3%) are over 65 years (national figure 15.8%); 30,700 (7.2%) over 75 years (national figure 7.0%); and 6,800 (1.6%) over 85 years (national figure 1.5%) [7]. It is, however, a region with an incidence of heart disease above the national average. The standardised mortality ratio (SMR = observed deaths/expected deaths \times 100) for the Plymouth Health District is quoted as 124 for younger males (age 35–64) who die from acute myocardial infarction [8].

Management of ischaemic heart disease

We found a marked difference in the management of coronary artery disease compared to other cardiological illness. The GPs' answers to the questionnaire suggest that they would refer a large proportion of patients with heart failure, heart murmurs, or cardiac arrhythmias for a specialist opinion, but most of them would continue to manage patients with symptomatic coronary artery disease without further investigation. These findings were confirmed by the analysis of the data from the cardiology outpatient clinic, where coronary artery disease represented only a small

proportion (19%) of the total elderly referrals.

We presume from these findings that, with respect to symptomatic ischaemic heart disease, GPs perceive cardiac surgery to be a grossly overburdened service in which elderly patients would not even be considered for bypass grafting or angioplasty, or, if they were, that the waiting times would become so long that younger patients might die from a potentially treatable condition [2, 5].

Coronary care unit admissions

Plymouth has no age-related admission policy to the coronary care unit and, as expected, a high proportion of patients is elderly. Despite the high uptake for thrombolysis in elderly patients previously reported by this unit [9], the mortality rate was high (29% aged 65 and over, 34% aged 70 and over). This might reflect severe disease in older patients, and a retrospective analysis showed that half had a history of ischaemic heart disease before admission, many of whom had not been investigated. Few patients were investigated after discharge from hospital although the majority had no other medical condition that would have precluded investigation.

Non-invasive cardiological investigations

Of the non-invasive cardiological tests undertaken in the elderly, echocardiography and 24-hour ambulatory electrocardiography were clearly the two major investigations requested; indeed, the numbers involved were above the recommended guidelines of the British Cardiological Society [10] which suggests up to 250 echocardiograms and 200 ambulatory electrocardiographs per 100,000 population (Table 3). However, the number of exercise electrocardiographs undertaken in Plymouth in all age groups was far below the proposed recommendation of 300 per 100,000 population, running at the 76% mark overall, and of these less than 7% were done in elderly patients. Despite this low referral rate in the elderly, positive tests were common (42%), with a subsequent referral rate for coronary angiography of 57%.

Table 3. Non-invasive cardiological investigations undertaken in the Plymouth Health District (PHD), population 429,225, in 1992: comparison with recommendations of the British Cardiac Society (BCS).

Investigation	BCS recommendation per 100,000	Expected no. in PHD	Actual no. in PHD	% difference
Echocardiograms	250	1,075	1,662	+ 55%
24-hour electrocardiograms	200	860	900	+ 5%
Exercise	300	1,290	985	- 24%

Echocardiography: Unless a valvular lesion was involved, the changes in management resulting from echocardiography were quite low—18% of patients in our survey. However, of the 281 patients studied to define a murmur or to assess the severity of a previously documented valvular lesion, 29 were referred for cardiac catheterisation and 22 of them for valve replacement surgery, confirming that modern echocardiography is an important investigation for assessing valvular function, particularly in elderly subjects.

24-hour ambulatory electrocardiography: Symptomatology is usually a major reason for conducting 24-hour ECG tape investigations, but in this study only 42% of patients developed symptoms while being recorded, and only 17% of them were related to any change in cardiac rhythm.

Conclusions

These results suggest that both outside and within the hospital the perception of coronary artery disease in the elderly is of a medical condition that should be treated conservatively. This result does not accord with the recommendations of the working groups of the Royal College of Physicians [1,4].

The risks of coronary artery bypass surgery are appreciably higher in the elderly but are not prohibitive (8% overall mortality in > 70-year-olds vs 1.9% mortality in < 70-year-olds) [11]. Several studies have concluded that the operative risk for coronary bypass grafting (CABG) is acceptable in the elderly, especially if it is an elective revascularisation, with peri-operative mortalities of between 5 and 13.9% [12–16] for septuagenarians and octogenarians. CABG is also viewed as an effective treatment for disabling angina in the elderly [13,17–19].

Our results confirm that discrimination exists against the elderly patient with coronary artery disease. Plans for more active investigation and intervention in this age group must be included when future cardiological services are being planned. A year after the publication of the Royal College's report on cardiological intervention in elderly patients [1], little notice appears to have been taken of its recommendations.

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