Capacity and equity in cardiac rehabilitation in the eastern region: good and bad news

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Abstract
Aim To document current baseline eligibility for Phase 3 cardiac rehabilitation (CR) and the capacity to meet this need in hospitals in the Eastern Regional Health Authority.

Methods Information on the eligible population and the capacity for CR was collected in all nine hospitals retrospectively (February-March 2001).

Results Forty-seven per cent of eligible patients were invited to participate with only two-thirds attending. Completion rates were very high (89%) in attenders. Age and health board area were significant independent predictors of being invited to CR. Gender was not independent of age. Fifty-three per cent of the need for this service was met by capacity in the region's nine hospitals in 2000 rising to 59% in 2002.

Conclusions Many eligible patients are not invited to CR. Lack of capacity is a problem. Among the invited, non-participation is a factor. Inequity in age and inter-hospital variation in invitation is noted.

Introduction
The national cardiovascular strategy was launched in Ireland in November 1999. Ten recommendations were made emphasising the need to provide cardiac rehabilitation (CR) in all hospitals treating patients with heart disease. In the eastern region, as part of the planned approach to implementing 'Building Healthier Hearts' an initial region wide audit of eligibility was undertaken as well as a review of the provision of CR services. The aim of this work was to document baseline information in 2002 on the proportion of the population eligible for CR who receive an invitation to a Phase 3 programme in all nine hospitals in the Eastern Region. The objectives were: (a) to collect baseline data on variables related to eligibility and invitation to participate in CR, (b) to analyse the data in relation to age, gender, geographical location, hospital and general medical services (GMS) status, (c) to establish the proportion of eligible people who were invited to a programme of CR, attended initial classes and completed the CR programme. The eligible population included patients who had a myocardial infarction (AMI), percutaneous transluminal coronary angioplasty (PTCA) or a coronary artery bypass graft (CABG) in the time period.

A second piece of work sought to document the capacity within the CR departments of each of the nine hospitals and subsequently to integrate the information on capacity with eligibility.

The eastern region comprises the counties of Dublin, Kildare and Wicklow with a population of 1.4 million at the last census (2002). The region is served by nine hospitals, five of which offer tertiary services to many parts of the country. Eight of the nine hospitals have CR facilities though some are only in operation in the last 2-3 years. The ninth hospital is planning to bring a CR programme on stream in 2004.

Patients and methods
Audit of eligibility
The audit was conducted as a retrospective study using a simple proforma for individual data collection. All nine hospitals agreed to participate, the hospital without a current CR programme providing data on eligible patients only.

The criteria for inclusion in this study were all patients with a diagnosis of AMI or who had PTCA or CABG in the study timeframe from 1 February to 31 March 2001 (one hospital provided data for April/May 2001). These criteria accord with the patient group targeted in the National Service Framework (NSF) in the UK. Within this group of patients there were no exclusions for co-morbidity. Patients with other forms of cardiac intervention or those with heart failure were not included. The population was established in each hospital from a combination of data sources — hospital databases (PAS/HIPE), coronary care registers, CR databases and PTCA/CABG registers.

Each hospital gathered the data relevant to its own patients and sent anonymised data to the author (SJ) at the Department of Public Health at the Eastern Regional Health Authority. Analysis was carried out using SAS package. Statistics used for univariate analysis were (a) Mantel-Haenzel chi square and summary measures for categorical data and (b) t-test and non-parametric ANOVA for continuous data. Logistic regression was used for multivariate analysis.

Validation of the data were carried out in conjunction with each hospital with resultant deletions for the following reasons: patients who died while in hospital (19), those outside the timeframe (24), those following procedures other than the ones outlined (13), those recorded more than once, either within the same hospital or between two hospitals (duplicates n=52).

Review of capacity in each CR department
Each hospital was asked to document the capacity in their department. This was done by identifying the number of programmes run each year and the number of patients in each programme. As this is a changing area with investments in the first two years of the programme, hospitals were asked to provide data for April 2001 and April 2002.

Results
Details on 754 patients were received for the two-month period. However, 108 (14%) records were deleted for the reasons outlined in the methods section leaving 646 patients who had either an AMI, a revascularisation procedure or both in the nine
Table 1. Patients eligible, invited, attended and completed cardiac rehabilitation

<table>
<thead>
<tr>
<th>Hospital</th>
<th>No. of patients eligible</th>
<th>No. of patients invited (uptake)</th>
<th>No. of patients attended as % of those invited</th>
<th>No. of patients completing as % of the attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Coast Area</td>
<td>85</td>
<td>31 (37%)</td>
<td>16 (52%)</td>
<td>18 (100%)</td>
</tr>
<tr>
<td>Northern Area</td>
<td>183</td>
<td>85 (44%)</td>
<td>64 (75%)</td>
<td>56 (87.5%)</td>
</tr>
<tr>
<td>South Western Area</td>
<td>152</td>
<td>85 (56%)</td>
<td>53 (62%)</td>
<td>46 (86.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>430</td>
<td>201 (47%)</td>
<td>133 (60.2%)</td>
<td>118 (89%)</td>
</tr>
</tbody>
</table>

Profile of the CR activity for eastern residents

The need for and use of CR services by residents of the eastern region in the two-month time period is outlined in Table 1. Less than half of eligible patients (47%) were invited. Two-thirds (66.2%) of invited patients attended initially. However, once the patient attended for CR the completion rate was very high (89%) with little variation seen.

Patient profile

Age, gender and health board

Table 2 illustrates the age breakdown of this group of patients. The mean age of the people eligible for CR was 64.4 years and that of the invited group was 60.4 years a difference which was significant (t=-5.59; p=0.0001).

The majority of people eligible for CR were male (65.6%). Eligible women were older with a mean age of 68.5 years compared with 62.2 years for males (z=5.41; p=0.0001).

A significant linear association was found between age group and invitation status with older patients less likely to be invited to CR (χ²=41.8; df=1; p=0.001). Males were in the majority in the invited group (53%) being twice as likely to be invited to CR as their female counterparts (OR=1.83; 95% CI 1.22-2.76; p=0.004) see Table 3. However, having controlled for age the adjusted odds ratio was reduced to 1.41 (95% CI 0.91–2.18) and so was not significant.

Also, there was a significant univariate association between invitation status and health board area (χ²=11.7; df=2; p=0.003) with patients from the South Western area more likely to be invited. Logistic regression analysis confirmed that age and health board area were significant independent predictors of being invited to CR.

Attendance rates did not differ significantly between age groups or between genders but they were higher significantly for patients seen at hospitals in the Northern Area compared to the other two areas combined (OR=2.08, 95% CI 1.12 – 3.85; p=0.02).

Hospital

The number of eligible patients varied across the nine hospitals from 2 to 101 patients. Further, invitation rates varied by hospital from 0% to 96% and attendance rates from 29% to 84%.

General Medical Services cover

General Medical Services (GMS) status is conferred on people eligible following income assessment and permits entitlement to free health services. Data available on GMS status in this study were disappointing with 39% of the data missing on this variable. Data from four hospitals had GMS recording in excess of 95% (n=229) accounting for 53% of patients in this two month sample. As the mean age of patients in these four hospitals (excluding five cases where GMS status was unknown) was similar (64.0 years) to the overall group (64.4 years) analysis was carried out on this subgroup.

The GMS group (56.3%) was as likely as the non GMS group to be invited to CR (OR=1.39; 95% CI 0.82-2.36). Similarly, no difference was seen between GMS and non GMS in attendance at first appointment. Further, completion rates in the GMS group were equally high as the non GMS group.

Profile of capacity

The two-month period of the study was taken as a sample for the year as no seasonal variation in AMI, CABG or PTCa discharges was found. Consequently, the estimated number of patients requiring CR for the twelve-month period in 2001 was 2,580 (see Table 4). Data from a previous study on capacity in 2001 and an update of this work for 2002 are also presented in Table 4.

Across the region in 2000, there were 1,364 places meeting 53% of the need for CR. In 2002 the number of places rose to 1,520 meeting 59% of need. Four hospitals met over 90% of their identified need with four more hospitals only having the ability to meet between 35 and 51% of their need and the ninth hospital yet to open a facility in 2004.

Table 4 shows the match between eligibility and capacity when hospitals were aggregated into the three Health Board areas. The South Western area had the largest deficit of CR capacity but also had the one hospital without a currently functioning CR department.