Advisory External Defibrillator Availability in General Practice

Abstract:
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This study aimed to describe the availability of advisory external defibrillators (AEDs) in Irish General Practice. The study utilised a computer generated random sample of Irish general practitioners and involved a postal questionnaire, with telephone follow up of non-responders. The cohort of GPs already known to possess an AED (via participation in the Merit Project) was excluded. 115 valid paper survey responses were received representing a response rate of 59%. Of the responding GPs identified themselves as Merit project participants and were excluded from further analysis. 74/110 GPs (67%) reported having one or more AED(s) available for use at their practice. 41/77 GPs (53%) who had not responded to the paper survey but were contactable by telephone had an AED available. When AED availability was examined by practice setting a higher proportion of rural and mixed settings had AEDs available than in urban and city areas. Cost was reported as the most common reason for not having an AED.

Introduction

There are approximately 2,000 sudden cardiac deaths in Ireland annually. In up to 80% of cases, sudden cardiac death is related to coronary artery disease with the commonest mechanism of death being due to ventricular fibrillation (VF). VF is an sudden onset of chaotic disturbance of the hearts electrical rhythm, which stops the output of blood from the heart. An AED (Advisory External Defibrillator) is a small, portable piece of equipment that can deliver an electric shock in order to convert VF to a sustainable or usual rhythm (defibrillation). Survival rates following cardiac arrest are directly related to time to defibrillation. Each minute of delay between cardiac arrest and defibrillation reduces the probability of survival to discharge by 10%.

In Ireland GPs are well placed to deliver early care in many communities; however the question of whether GPs are likely to have an AED available has to date been unanswered. The University College Dublin MERIT Project is a prospective observational study of cardiac arrest with resuscitation attempts by GPs in Ireland. In 2013, 495 Merit sites (including practices that reported having defibrillators) were recruited. Of these 495 sites, 411 were recruited in the 12 months after the cardiac arrest was treated by a GP. This study explores the availability of advisory external defibrillators (AEDs) amongst GPs not already involved in the Merit project (Merit GPs are by definition already equipped with an AED).

Methods

This observational study involved a postal survey of a computer generated random sample of Irish GPs, excluding those currently involved in the Merit Project. Non-responders were followed up by telephone survey. Ethical approval for this study was sought from UCD's Medical Research Ethics Committee. The postal response rate was 59%. The Irish Medical Directory was interrogated in November 2013 revealing 2,650 individual general practitioner listings in the Republic of Ireland. A 12.5% computer generated random sample of this listing was taken (331 GPs). GPs who were known to participate in the Merit Project (117 GPs) were excluded from this list. This study aimed to contact only one GP per practice; the addresses of the remaining 214 GPs were therefore examined and where it was clear that two or more GPs were practicing from the same practice premises only the first listed GP was included. The final sample of named GPs (one per individual practice) numbered 201.

A bespoke paper based survey instrument was designed for data collection purposes. This was composed of 36 questions divided into four sections; Demographics, Practice Profile, AED Key Questions and Practice Defibrillator(s). A survey pack containing a cover letter, the survey, an independently returned stamped postcard and a stamped addressed return envelope was posted to 201 named GPs in mid February 2014. Each independently returned stamped postcard had a number, which enabled an individual GP to be identified as having returned a survey; however since the postcard was returned separately to the questionnaire the exact questionnaire source remained anonymous. Two separate databases were created; one for paper survey responses and the second for that of the telephone survey. The population total for the purposes of data analysis was thus 110. Although 115 returned paper surveys, five GPs reported that they already participated in the Merit project; these GPs were also excluded from data analysis. 74/110 GPs (67%) reported having one or more AED(s) available for use at their practice. 41/77 GPs (53%) who had not responded to the paper survey but were contactable by telephone had an AED available. An AED (Advisory External Defibrillator) is a small, portable piece of equipment that can deliver an electric shock in order to convert VF to a sustainable or usual rhythm (defibrillation).

Results

Postal Survey

Of the 110 valid questionnaire responses received 74 GPs (67%) reported having one or more AED(s) available for use at their practice. Of the 74 GPs who had an AED available 51 (69%) had AEDs that were only available at the practice premises; 14 (19%) had AEDs also available on house calls and 9 (12%) had AEDs available at the practice, on house calls and whilst the doctor was off duty. When AED availability was examined by practice setting (107 respondents provided information), a higher proportion of rural and mixed settings had AEDs available than in urban and city areas 26/50 (52%). A chi-square test of independence was performed to examine whether there was evidence of a relationship between practice setting and AED availability. The evidence for a relationship between these variables was strong: Chi-square = 12.956, df=1, p <0.001.

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Of the 35 GPs who reported not having an AED, 49% detailed cost as a reason, 34% listed proximity to hospital as a reason, 11% felt having an AED was not relevant to the GP role, a further 11% considered maintenance to be a reason, 11% considered inconvenience to be a reason, 11% felt having an AED was not relevant to the GP role and 11% felt having an AED was not relevant to the GP role. Of note one GP reported that they did not know whether or not they had an AED available. 34/74 (46%) of GPs who confirmed AED availability via the postal survey reported that they had used an AED to treat cardiac arrest in the preceding 10-year period. On average those GPs who had used an AED to treat cardiac arrest did so 2.2 times over that period. One GP reported using an AED on 10 occasions. GPs reported using an AED to treat cardiac arrest on 75 occasions in total with survival to hospital discharge reported on 26 occasions representing a reported survival to hospital discharge rate of 35% in cases where an AED was used.

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As previously stated an attempt was made to make telephone contact with the practices of each of the 95 GPs who had not returned a postcard. 77/95 (81%) were contactable and of these 41 (53%) reported having an AED available, 31 (40%) reported not having an AED, with the remaining 5 (7%) either being unsure or not wishing to comment.

Discussion

The basic issues of GP involvement in cardiac arrest management continue to draw mixed responses; Toon recently questioned the value of Basic Life Support training for GPs, the 2010 RACGP Practice Standards 4th Ed do not

require an AED as essential emergency equipment and in Britain, the Care Quality Commission recommends but does not

require general practices to have defibrillators. In Ireland the HSE Primary Care Reimbursement Scheme and Irish College of General Practitioners provide no guidance on defibrillator availability. Despite the above observations this study has demonstrated that a significant proportion of Irish GPs have already equipped themselves with an AED. The paper questionnaire respondents reported AED availability to be in the region of 67% while the follow up telephone survey of non-responders reported AED availability to be 53%. It is possible that GPs with an AED might have been more likely to respond to the postal survey thus biasing the results. The telephone follow up component serves to limit this effect on the overall result. As less GPs returned postcards (150) than returned completed surveys (115) there may be some overlap in responses between the two parts of the study. Thus, it is not possible to aggregate the statistics for overall AED availability however considering the above figures it is likely that AED availability in this sample of Irish general practices is at least 53%.

If Merit practices (who by definition are equipped with an AED) are considered to represent one third of an estimated 1,500 Irish general practices then this study would suggest that overall at least two thirds of Irish general practices have an AED available at the present time. This observation would compare favorably with published studies of AED availability in other European countries. It is interesting to note that this study found the percentage of general practices with AED availability to be significantly higher in rural/mixed settings than in city/urban settings. This is an important finding in the context of Merit data, which illustrated that more cases of cardiac arrest with GP involvement occurred in rural and mixed settings than urban ones. Promoting strategies to insure rural GPs continue to be equipped with an AED might form part of a strategy to provide evidence-based interventions to patients who suffer cardiac arrest in more remote locations with longer statutory EMS response times.

Data from the Merit Project suggests that a high percentage of cases of cardiac arrest (47%) occur in the patients own home. Although GPs perform house calls as part of their day to day work, the data collected in this study demonstrated that AED availability was primarily at the surgery location (69%) and fewer GPs had AEDs available on house calls (19%) and when off duty (12%). There may be potential to improve cardiac arrest outcomes by increasing GP AED availability outside of the surgery. It is notable that almost half of the GPs who did not have an AED available listed cost as a factor. In a time of significant funding pressures cost is an issue that warrants consideration. The issue of AED cost is not new and has been previously described as a limiting factor in the international literature. The Merit study described 36% of practices as having been involved in at least one cardiac arrest with resuscitation attempt over a 5-year period. Although cardiac arrest is not a frequent clinical occurrence in Irish general practice it is likely that over time many GPs will encounter it. This study indicates that although a high percentage of Irish GPs are already equipped with an AED, additional capacity could be developed by focusing on a number of specific issues such as cost supports and prioritisation of remote and rural areas.

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