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Defibrillators

Their use in general practice

■ During the development of The Royal Australian College of General Practitioners *Standards for general practices* (3rd edition) in 2005, the unflagged (nonessential) indicator 'the practice has a defibrillator' was tested in a survey of 200 practices Australia wide. Defibrillators were present in 18% of these general practices: 20.5% of surveyed practices thought it was feasible to have a defibrillator and 32.5% thought it was acceptable to have one. With that feedback, the committee dropped this indicator from the final standards document.

A number of other issues were raised by the survey including:

- is not the incidence of cardiac arrest in general practice very low and the cost of equipment high?
- would we as general practitioners be buying equipment that we have neither the expertise to use well, nor the time to gain and maintain the expertise?
- is the effectiveness of early defibrillation enough to require expenditure on a piece of equipment that sits in the corner and gathers dust?

Cardiac arrest in general practice

The incidence of cardiac arrest in or close to general practice clinics is an unusual event, however it does occur. There has been little literature to quantify this. One quality study by Engdahl and Herlitz,¹ looked at the locality of out of hospital arrests in Göteborg, Sweden between 1994 and 2002 and found that 18 of the 2194 arrests that could be located occurred in GPs' offices (0.82%); 3% occurred in cars, 13% outdoors, 2% in ambulances, and 65% were in homes.

If less than 1% of cardiac arrests are occurring in a medical facility (namely general practice clinics) is it unreasonable for these facilities to have a defibrillator?

The new defibrillators

Technology has reduced the challenge of using defibrillators with new biphasic automatic external defibrillators (AEDs). Decisions about when to defibrillate and how many joules to dial up are

no longer needed. Once the two pads are placed on the patient's chest the machine takes the operator through the defibrillation process using voice prompts. The operator just has to push the button when told. It is therefore not difficult to have all clinical staff capable of using one. The maintenance of this skill can be undertaken at the same time as CPR updating by the same trainers once a year.

The biphasic waveform was developed in the 1980s. This is usually a reduced energy waveform (150–200 joules maximum as opposed to 360 joules for monophasic waveform). The charge is delivered in one direction for half the shock and in the electrically opposite direction for the second half. A Cochrane review of seven clinical trials found that all showed low energy biphasic defibrillation was equivalent or superior to higher energy monophasic defibrillation.²

Automatic external defibrillators can be put on the shelf and left to do their own self checks. They are lightweight and portable, and – with most being lower energy users than monophasic machines – the battery life is longer with shorter time to full charge.³

The cost of a unit is approximately \$2000–3000 – a cost which now allows them to be seen in high density public places such as the Melbourne Cricket Ground, airports and shopping centres. Their ease of use has also allowed them to become part of basic life support training courses for the general public.

Why should general practices have one?

The outcome of early resuscitation involving defibrillation provides the strongest argument for GPs considering the purchase of a unit. Survival is better the earlier defibrillation is given to people in ventricular fibrillation (VF) or ventricular tachycardia (VT), particularly if it is delivered in the first 4 minutes – the so-called 'electrical phase' of the arrest.⁴

Colquhoun⁵ found that of 555 arrests treated by GPs in the United Kingdom, 436 were due to heart disease and 144 people (34%) survived to leave hospital. If the rhythm was VF or VT, early defibrillation (within 2 minutes) gave a 63% survival rate. Valenzuela et al⁶ studied AED use in American casinos and showed figures which were similar, with 74% survival if shock to VF occurred in less than 3 minutes.

These figures contrast with a retrospective study in Geelong, Australia of 115 patient care records in prehospital cardiac arrests managed by ambulance personnel between July 1996 and September 1999.⁷ Only 4.3% of these patients survived to leave hospital. The authors commented that the median response time of 9 minutes had to be reduced to improve outcomes.

From the above figures, reliance on ambulance defibrillators appears to be a poor second option for cardiac arrests in the general practice setting. This is because of time delay.

Cobbe et al⁸ summarise the above: 'The definitive treatment for ventricular fibrillation is early defibrillation'. Quoting the work of Larsen,⁹ they say the chance of a successful outcome diminishes by about 7–10% for every minute defibrillation is delayed. Eisenberg states that: 'Basic life support measures, when applied effectively, at best provide significantly reduced cardiac and cerebral perfusion'.¹⁰

Conclusion

The clinical scenario of cardiac arrest is confronted infrequently in general practice, but when it does occur the GP will need to play a leading role in resuscitation. It is clear that access to a defibrillator in the first 3–4 minutes can improve outcome significantly.

We are unable to triage all patients with chest pain away from our general practices, therefore our clinics are exposed to a small but definite risk of cardiac arrests occurring there. Early defibrillation is a key part of treatment and early defibrillation in most circumstances requires equipment to be on site.

After reviewing the literature it is difficult to argue against defibrillators in general practices other than on the argument of cost and the low likelihood of the event occurring. Defibrillators save lives and, as they become more common, community expectations of access to them in medical facilities will increase.

Conflict of interest: none declared.

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