

## LETTERS TO THE EDITOR

● The British Heart Journal welcomes letters commenting on papers that it has published within the past six months.

● All letters must be typed with double spacing and signed by all authors.

● No letter should be more than 600 words.

● In general, no letter should contain more than six references (also typed with double spacing).

### Implantation of cardioverter-defibrillators at district general hospitals

SIR,—The automatic implantable cardioverter-defibrillator (ICD) has become the treatment of choice for failed sudden death syndrome.<sup>1-3</sup> However, ICDs are underused in the United Kingdom simply because doctors are often unaware of them, largely because there are so few implant centres.

We report our experience of successful ICD implantation at a cardiology department of a district general hospital in five men (mean age 66 years) who had had multiple admissions with syncopal ventricular tachycardia or cardiac arrests causing admission to hospital in ventricular fibrillation. All patients had undergone programmed electrical stimulation to assess the inducibility of arrhythmia and to test the efficacy of various drugs and drug combinations before it was decided to implant a cardioverter-defibrillator. Cardiac catheterisation was undertaken in all patients to exclude important coronary disease.

Programmed stimulation was performed at two sites in the right ventricle with a maximum of three extrastimuli during sinus rhythm and ventricular pacing at two drive cycle lengths of 600 ms and 500 ms. Other causes of arrhythmia such as drug effects or electrolyte imbalance were also excluded.

Six patients were identified as needing the implantable device, however, one of these patients was discovered to have severe triple vessel disease and was referred for coronary artery bypass grafting. The remaining five men (aged 54-72 years) had been admitted to hospital on 1-5 occasions (mean 2.2) with a primary ventricular arrhythmia not caused by an acute myocardial event. They had been tested while taking various commonly used antiarrhythmic drugs (mean number of drugs 3.4 (range 2-6)). All patients were tested while taking amiodarone alone and in combination with at least one other antiarrhythmic agent. The underlying cardiac disease included ischaemic heart disease, hypertensive cardiomyopathy, and idiopathic dilated cardiomyopathy. They presented a wide range of ventricular function: the mean ejection fraction 39.4% (range 5-72)) was calculated from a single plane.

Devices were successfully implanted in all five patients. They remained well without complication over a follow up period of 6 months to 14 months. Three have received successful antitachycardia treat-

ment from the device and none has required defibrillation shocks. One patient has received an inappropriate defibrillation shock without complication.

Our results indicate that ICDs can be successfully implanted in a district general hospital provided the cardiologist has appropriate electrophysiological experience and suitable facilities for the investigation and subsequent management of the patients. Currently most patients admitted to a district general hospital with an out of hospital cardiac arrest are diagnosed as having a myocardial infarction and consequently many are denied potentially life-saving treatment. This problem will only be resolved by raising the level of awareness of all doctors of recurrent symptomatic primary ventricular arrhythmia and failed sudden death syndrome, and this will only be achieved by increasing the number of implant centres in the United Kingdom. It is neither necessary nor feasible for implant centres to be provided in

every district general hospital, but patients must not be denied treatment simply because they live hundreds of miles from the nearest implant centre.

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- 1 Akhtar M, Avital B, Jazayeri M, Tchou P, Troup P, Sren J, *et al.* Role of implantable cardioverter defibrillator therapy in the management of high risk patients. *Circulation* 1992;85 (suppl I):131-9.
- 2 Bardy GH, Troutman C, Poole JE, Kudenchuck PJ, Dolack GL, Johnson G, *et al.* Clinical experience with a tiered therapy, multiprogrammable antiarrhythmia device. *Circulation* 1993;85:1689-98.
- 3 Powell AC, Fucho T, Finkelstein DM, Goran H, Cannon D, McGovern VA, *et al.* Influence of implantable cardioverter-defibrillators on the long term prognosis of survivors of out of hospital arrest. *Circulation* 1993;88:1083-92.

### Antibiotic prophylaxis in permanent pacemaker implantation

SIR,—The suggestion by Mounsey *et al* that prophylactic antibiotics should be routinely prescribed for pacemaker implantation at every centre<sup>1</sup> is not supported by their findings.

In a prospective randomised trial at our centre we found that with meticulous pre-operative skin preparation, the use of an antibiotic spray into the pacemaker pocket, and close postoperative follow up no benefit with routine antibiotic prophylaxis was seen.<sup>2</sup> More recently we prospectively audited the early complications of endocardial pacemaker implantation in 1059 con-

secutive patients paced at our centre over a 22 month period. Ten patients underwent repeat operation for pacemaker pocket infection within 2 months of implant. Analysis of factors contributing to this complication showed a 7-fold excess among patients with a temporary pacing electrode in situ at the time of their permanent implant (7 (3%) of 242) compared with those without (3 (0.4%) of 817,  $P = 0.0014$ ). Findings based on the first 926 patients in this group were similar.<sup>3</sup>

We do not routinely give antibiotic prophylaxis. Only 117 patients (11%) received antibiotics (at the operator's discretion). Analysis of infection rates according to use of antibiotic therapy shows no significant benefit:

| Group                           | Antibiotics (%) | No antibiotics (%) | P Value |
|---------------------------------|-----------------|--------------------|---------|
| All patients                    | 3/117 (2.6%)    | 7/942 (0.7%)       | 0.16    |
| Patients with no temporary wire | 0/43 (0%)       | 3/774 (0.4%)       | 1.0     |
| Patients with temporary wire    | 3/74 (4%)       | 4/168 (2.4%)       | 0.76    |

Mounsey *et al* showed that the subgroup of patients at the highest risk of infection (those with temporary electrodes) do not seem to benefit from antibiotic prophylaxis. Their exclusion of 19% of such patients from the study may thus bias their overall results. Furthermore, in their analysis they included two patients (not treated with antibiotics) with sterile erosions. These erosions may have been caused solely by mechanical factors; exclusion of these two patients from the infected group considerably reduces the statistical significance of the results (to a  $P$  value of 0.041 using a Yates's corrected  $\chi^2$  test).

In addition, Mounsey *et al* had an infection rate of 3.3% in those patients not treated with antibiotics. This is significantly higher than our rate of 0.74% in a similar (unselected) subgroup. A reduction of their infection rate in such patients to 2.5% (perhaps by spraying the pocket with antibiotic) would result in no statistically significant advantage being evident with the use of antibiotic prophylaxis.

We believe therefore that antibiotic prophylaxis should not be used routinely in pacemaker implantation; further randomised studies assessing the use of antibiotic spray into the pacemaker pocket at implant are required.

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- 2 Ramsdale DR, Charles RG, Rowlands DB, Singh SS, Gautam PC, Faragher EB. Antibiotic prophylaxis for pacemaker implantation: a prospective randomised trial. *PACE* 1984;7:844-9.
- 3 Aggarwal RK, Connelly DT, Ray SG, Coulshed DS, Ball J, Charles RG. Acute and early complications of permanent pacing: a prospective audit of 926 consecutive patients from a UK centre [abstr]. *Br Heart J* 1994;71:P60.