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Psychopathology in postinfarction patients implanted with cardioverter-defibrillators for secondary prevention. A cross-sectional, case-controlled study☆

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Abstract

Objective: To determine (1) the incidence of anxiety and depression in patients implanted with defibrillators for secondary arrhythmia protection after myocardial infarction; (2) the effect of comorbidity and receipt of shock therapy on psychosocial maladjustment. **Methods:** Cross-sectional, one-off, questionnaire-based (HADS; MOS SF-36), case-controlled study of defibrillator recipients (n=100) from a 3-year implant period and three groups of matched controls [pacemaker (n=50), coronary intervention (n=50), atrial fibrillation (n=50)], sharing specific preselected previous health experiences. Spouses of each subgroup (n=106) were also studied. Although a cardiac rehabilitation program was available routinely for postinfarction patients, no specific rehabilitation was provided after defibrillator or pacemaker implant. **Results:** Mean scores for each assessment were similar for each group. Individual patient scores, however, revealed similarly high incidences of anxiety (24–34%) and depression (14–22%) in all groups. Experience of implantable cardioverter-defibrillator (ICD) 'shock(s)' and 'shock storm(s)' (≥3 shocks in 24 h) increased anxiety significantly. HADS criteria for anxiety 'caseness' or borderline 'caseness' were met in 63.6% of shock-storm recipients. Abnormal anxiety scores did not differ with interval from index event. Individual HADS scores also identified high incidences of anxiety in all spouse groups (25–48%). **Conclusions:** Experience of shock storm precipitates pathological levels of anxiety in ICD recipients, and need for an ICD contributes to spouse anxiety. Individual CBT is indicated for patients who experience multiple shocks along with psycho-education for spouses. Anxiolytic and antidepressant medications may be indicated as part of their psychological rehabilitation.

Keywords: Arrhythmia; Implantable defibrillator; Stress disorder; Psychological therapy; Cardiac rehabilitation

Introduction

The incidence of psychological disorder in patients with implantable cardioverter-defibrillators (ICD) is variously reported to be between 15% and 60% [1–3]. Increased anxiety has been found in 24–84% and of clinical significance in 13–38%. Depressive symptoms have been reported in 10–58% [2,3] and meeting criteria for clinical

Abbreviations: AF, atrial fibrillation; CBT, cognitive behavior therapy; *DSM-IV*, *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition*; HADS, Hospital Anxiety and Depression Scale; ICD, implantable cardioverter-defibrillator; MOS-36, medical outcomes study short form 36; PCI, percutaneous coronary intervention; SPSS, Statistical Package for Social Sciences.

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depression in 9–15% [4]. Such wide differences in reported rates are explained by small sample sizes, patient selection bias, definitions of psychopathology, choice of evaluation instruments, lack of controls, and the timing of assessment(s) in relation to ICD implant and/or receipt of shock therapy. Any psychological maladjustment, whatever its true extent, impairs quality of life and detracts from the anti-arrhythmic benefits of ICDs. Whether psychological problems are attributable to the context in which ICDs are implanted—extent of underlying heart disease, fear of dying, serious arrhythmias—or to the nature of device therapy itself remains controversial [5,6]. Although most clinicians agree that a transient increase in anxiety is common in ICD recipients, many assert that it resolves spontaneously over the first 6 to 12 months [7,8]. Others report a chronic problem requiring specific management. Secondary adverse effects have also been observed in family members—consisting of changes in family dynamics, increased anger, stress levels, and depression with receipt of ICD shock therapy as a major contributory factor [9,10].

In contrast to the large randomized, multicenter trials of the anti-arrhythmic benefits of ICDs, studies of psychosocial impact of device therapy have been small, low budget, and inadequately powered to yield similar levels of evidence to guide rehabilitation. The lack of agreement in study findings to date makes it difficult to plan services to meet the needs of ICD recipients effectively.

This study had two aims: (1) to determine anxiety and/or depression rates and their severity in a one-off, cross-sectional assessment of patients implanted with ICDs for secondary prevention of ventricular tachyarrhythmias following myocardial infarction and (2) to investigate the role of the ICD therapy (and receipt of shock therapy in particular) in precipitating psychosocial maladjustment by comparing ICD recipients with matched patients from three cardiac 'control groups.' A substudy was also conducted in parallel with the main project to assess the impact of ICD therapy on spouses/significant other, by comparing spouses of ICD recipients with those of participants in the control groups.

Methods

Design

A cross-sectional design was used in which each ICD subject completed two questionnaires on one occasion only. From those who had ICDs already implanted over a 3-year period and were under follow-up, 100 were selected for study. ICD-implanted patients were postinfarction and all had devices implanted for secondary arrhythmia prophylaxis. Three control groups of 50 patients each, sharing some prior health experiences of ICD patients, were matched with the ICD cohort for sex, time to within 3 months of the index event, and closest available age match. *Control group Pace* had pacemakers implanted for standard bradycardia indications. This group shared device implant experiences with the ICD cohort and some had experienced syncope. *Control group PCI* had experienced percutaneous coronary intervention (PCI). They shared coronary artery disease but not arrhythmia or device experiences with ICD recipients. *Control group AF* had undergone catheter ablation for drug-resistant atrial fibrillation (AF) and so shared arrhythmia but not device or coronary disease experiences with ICD recipients.

Participant recruitment

Hospital databases of ICD- and control group patients under follow-up were used to identify patients available for study. Those who had had a first ICD implanted for secondary arrhythmia prevention following myocardial infarction in the period April 2004–March 2007 were considered for inclusion. Patient details were then divided according to time from ICD implant into 6-month 'time windows.' Twenty were selected from each time period (i.e., 6–12, 12–18, 18–24, 24–30, and 30–36 months] by a clinical psychology assistant, who had not been involved in their clinical care and had no knowledge of their well-being. ICD patients were invited to participate, initially by letter. Nonresponders were recontacted 2 weeks later. For patients who declined study participation or who remained uncontactable, another from the same time window was substituted and approached in the same sequence. Those who agreed were contacted and completed two questionnaires of psychological well-being by telephone on one occasion. Subjects from each control group were then matched with ICD subjects and invited to participate in the study in the same way. Later, spouses of ICD and control group participants were approached separately and invited to participate in a parallel *Spouse groups substudy*. Those who consented completed the same two questionnaires once. All interviews were conducted by an assistant clinical psychologist. The study was approved by the Newcastle and North Tyneside NHS Trust Ethics Committee.

Measures

Each patient was assessed only once. However, when individual ICD and control patient results were combined, they provided an even spread of measures over the first 3 years from the index event. The questionnaires used for assessment were as follows:

1. *Hospital Anxiety and Depression Scale* (HADS) [11]: A well-validated questionnaire for rating severity of anxiety and depression in medically ill patients. Mean scores characterize patient groups for comparisons. Anxiety and depression 'caseness' is established using established cut-off points (0–7=noncase, 8–10=border line, and 11–21=case). The clinical reliability and