

Original Article

Implantable Cardioverter Defibrillators in Octogenarians: Clinical Outcomes From a Single Center

Wilson DG¹ MB ChB, Ahmed N² MBBS, Nolan R² MBBS, Frontera A² MBBS, Thomas G² PhD, Duncan ER² PhD

¹University Hospital Southampton NHS Foundation Trust, Tremona Road, Southampton, SO16 6YD

²Bristol Heart Institute, University Bristol Hospitals NHS Foundation Trust, Malborough street, Bristol BS6 8HW

Address for Correspondence: Dr D Wilson, Cardiothoracic centre, Level E, Mail point 46, Southampton General Hospital, SO16 6YD, England. Email: Drdgwilson@gmail.com

Abstract

Aims: Limited data exist on outcomes in very elderly ICD recipients. We describe outcomes in new ICD and Cardiac Resynchronisation Therapy with Defibrillator (CRT-D) implants in octogenarians at our institution.

Methods: Patients aged 80 years and above who underwent de novo ICD or CRT-D implantation from January 2006 to July 2012 were identified. Clinical data were collected from the procedural record, medical and ICD notes. Baseline characteristics were compared using independent sample t test for continuous variables and Fisher's exact test for categorical variables. Kaplan-Meier curves were constructed.

Results: Ten per cent of all new ICD/CRT-D implants were aged 80 years and over. Median age was 83.0 years. Median follow-up was 29 months. Death occurred in 17 (34%). Median time to death was 23 months. Three deaths (6%) occurred within 12 months of ICD implantation. Appropriate therapy (ATP or shock) occurred in 19 (38%). Inappropriate therapy occurred in 6 (12%).

Rates of appropriate shocks and inappropriate therapy (shocks and ATP) and significant valvular incompetence were higher amongst deceased patients ($P=0.03$ OR 5.9 95% CI 1.3-27) and ($P=0.02$ OR 12 95% CI 1.3-112). Univariate analysis identified diuretic use ($P=0.008$ 95% C.I. 0.05 to 0.63) and appropriate shock ($P=0.025$ 95% C.I. 1.25 to 26.3) as predictors of mortality.

Conclusion: Octogenarians make up a small but increasing number of ICD recipients. This study highlights high survival rates at one year with acceptable rates of appropriate and inappropriate device therapy. Ongoing debate regarding the appropriateness of ICD in very elderly patients is warranted.

Key words: sudden cardiac death, implantable defibrillators, octogenarians

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Introduction

Elderly patients were largely excluded from the pivotal studies in implantable cardioverter-defibrillators (ICDs) and therefore evidence of effectiveness in elderly patients is based on single centre studies and registry data. In the United Kingdom, there is an aging population. The Office of National Statistics estimates that in 2035, 5% of the population will be aged 85 years and above, an increase of 250% compared to 2010. (UK Office of National statistics 2014)

Decisions to implant ICDs in the very elderly are more complex due to associated comorbidity and reduced life expectancy. Current guidelines recommend that ICD implantation should be considered in eligible patients if estimated survival is at least one year. [1] There is a paucity of ICD outcome data in the very elderly and all the data available on the octogenarians and nonagenarians is from North-American populations. [2-5] There is therefore need for UK outcome data in this unique population of patients. We describe the outcomes in all new ICD and Cardiac Resynchronisation Therapy with Defibrillator (CRT-D) implants in octogenarians at our institution.

Materials and Methods

All patients aged 80 years and above who underwent de novo ICD or CRT-D implantation from January 2006 to July 2012 at the Bristol Royal Infirmary (subsequently called Bristol Heart Institute) were identified from the hospital's ICD and CRT-D database. Clinical data for demographics, comorbidities and device therapy were collected from the procedural record, medical notes and ICD notes. The study was found to conform to the service evaluation standards set out by the hospitals Research and Development department.

Implant and follow up

All devices were implanted under the supervision of one of five supervising consultants working in the cardiac electrophysiology department during the study period. Implant technique varied between physicians according to preference and training. Defibrillation testing was performed at the discretion of the implanting physician. Programming of monitor zone, anti-tachycardia pacing and defibrillation zones was at the discretion of the implanting physician. Follow up was provided at regular intervals of 3-6 months.

Endpoints

Clinical outcome of all-cause mortality, date of first appropriate shock and date of first inappropriate shock were collected from ICD interrogation records. Local referring centres were contacted to ascertain outcomes in cases where patients had been followed up elsewhere. Information about device deactivation was collected. The study data collection date was the 22nd May 2013.

Definitions

Implant indication was defined as secondary prevention if the patient has survived a cardiac arrest or experienced ventricular tachyarrhythmia needing intervention or lasting for more than 30 seconds. Primary prevention was defined as the absence of cardiac arrest or ventricular tachyarrhythmia requiring intervention. An appropriate shock was defined as delivery of a defibrillation or cardioversion shock in the presence of VT/VF. An inappropriate shock was defined as the delivery of therapy in the absence of a ventricular tachyarrhythmia but in response to supraventricular tachycardia, oversensing or lead malfunction.

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