

REVIEW ARTICLE

ANXIETY AND DEPRESSION IN IMPLANTED CARDIOVERTER DEFIBRILATOR (ICD)

Afroditi Zartaloudi ¹, Anastasia Pappa ²

1. Lecturer, Nursing department University of West Attica, Athens

2. Phd, MSc, Staff Nurse, Psychiatric Nurse, First Department of Psychiatry, National and Kapodistrian University of Athens, Eginition Hospital, Athens

DOI: 10.5281/zenodo.3491455

Cite as: Zartaloudi, Afroditi, & Pappa, Anastasia. (2019). Anxiety And Depression In Implanted Cardioverter Defibrillator (Icd). Perioperative Nursing (Gorna), E-ISSN:2241-3634, 8(2), 16–23. [Http://Doi.Org/10.5281/Zenodo.3491455](http://doi.org/10.5281/zenodo.3491455)

Abstract

During recent decades, implanted cardioverter defibrillator (ICD) has turned out to be the most effective therapy available to prevent sudden cardiac death while implantation rates are increasing worldwide. Eligible patients are categorized in those who have already resuscitated from sudden cardiac death (secondary prevention) and those who are at increased risk due to the severity of their cardiac disease (primary prevention). The **aim** of the present study was to explore anxiety and depression in patients living with ICD. The **methodology** used included bibliographic research in electronic databases mainly in "pubmed" using key-words. **Results** : Anxiety and depression are both common among ICD recipients with females being more vulnerable, which is mainly attributed to their family and social roles, to their changed body image and sexual or reproductive health. According to literature review, ICD recipients encounter several issues after implantation which may trigger anxiety and depression such as diminished education about the device and its functions, delivered unintentional shocks, concerns about the future, fear of death, and various restrictions in daily lives. An essential aspect of alleviating anxiety and depression is to provide accurate and elaborate information to ICD recipients and involve their partners in the therapeutic regimen. Nowadays, as nurses are treating an increasing number of these patients from primary to tertiary clinical care settings, it becomes important to expand nurses' knowledge about ICD-related issues with the ultimate goal to alleviate their emotional burden. **Conclusions** : Education and follow-up interventions increase knowledge levels, decrease anxiety and depression and improve quality of life in ICD recipients.

Keywords: Implantable cardioverter defibrillator (ICD), sudden cardiac death, living with ICD

Corresponding author: : Zartaloudi Afroditi, e-mail: ezarta@univa.gr

Introduction

Sudden cardiac death (SCD) consists an important global public health problem.^{1,2} Out-of-hospital SCD is the cause of more than 60% of all deaths from cardiovascular disease, which is the leading cause of death, worldwide. The annual SCD incidence has been estimated between 300.00 and 450.000 in USA and 40–50 per 100.000 persons in China and Ireland.¹ As SCD is defined the unexpected death that occurs within 1 hour from the start of symptoms when death is witnessed, and within 24 hours of being seen alive and well when it is unwitnessed.¹ Though considerable advances have been made in understanding SCD or several risk scores have been developed, however an SCD may be the first manifestation of cardiac disease for the majority of those who suffer a sudden cardiac arrest.¹

Implantable cardioverter defibrillator (ICD) is an efficient treatment for reducing SCD.^{3,4} ICD is a surgically-inserted device into patients' chest for constant monitoring of the heart rhythm and for delivering of a strong electrical shock when detecting a life threatening arrhythmia.^{5,6} The benefits of ICDs in reducing mortality have been proven in both patients surviving a life-threatening event (secondary prevention) and those at high risk, but without such an event (primary prevention).^{3,4}

In Greece in the island of Crete, among 854 patients who received an ICD in a tertiary university hospital from 1993 until December 2013, the 623 cases (73%) accounted for primary prevention and the 231 (27%) for secondary prevention while most of these patients (490) suffered from ischemic cardiomyopathy.³ ICD is also a treatment in heart failure

patients where rhythm disorders become increasingly common with disease deterioration and insufficient cardiac performance. In HF patients with mild to moderate symptoms, ICD seems to reduce mortality rate.^{4,5}

Nowadays, the number of patients eligible for implantation is constantly growing. For example, in the United States, the ICD implantation rate has increased from 6.1% in 1993 to 46.2 % in 2006, with the average rate significantly increasing 17.9% per year.⁴ These numbers are expected to expand worldwide due to population aging, to increased life expectancy of cardiac patients, and to the alarming rise in the prevalence of coronary artery disease, obesity and diabetes. Though, it is not set an upper age limit for ICD implantation, however is recommend if survival with good functional status is expected to be above one year. Nevertheless, the decision to implant an ICD in the elderly remains controversial, given their reduced life expectancy.^{6,7}

Given that the device prolongs life span of patients, it is becomes apparent that the ICD may trigger anxiety and depression for various reasons such as fatigue,⁸ knowledge deficits,^{8,9} loss of independence, changed body image,¹⁰ limitations in daily life or social isolation^{11,12} and painful delivered shocks.⁶

More in detail, ICDs imply various concerns into patients' lives which are categorized into 4 main areas : a) education on device functions, shocks, impacts, battery lifespan, and follow-ups b) information on cardiac conditions, medications, c) daily living with ICD concerning

driving restrictions, resuming sexual activities, overcoming inconveniences, use of electrical appliances and phones, physical activities, swimming and several others.⁹

A recent study by Format et al.,¹³ who explored ICD recipients revealed the following themes: a) unmet education needs b) physical and psychological issues and c) recommendations regarding the device. For example, surroundings may interfere with the operation of the ICD and affect its performance.

The aim of the present study was to explore anxiety and depression in patients living with implanted implantable Cardioverter Defibrillator (ICD).

Literature review

The challenge of living with an ICD has not been deeply explored in several countries, and information is lacking in this area. Additionally more, the existing technology, of ICD is limited away from tertiary implanting sites. Due to the short-term inpatient stay, limited information is obtained by healthcare professionals regarding patients' experiences, attitudes, perceptions or emotional burden during pre or post ICD implantation period.

Patients have to confront with technology and the demands of the device. Gaining acceptance of the ICD is a key element to adjust to living with it.⁹ Interestingly, a cardiac implanted device may save recipients from life-threatening arrhythmia, but at the same time, this life sustaining technology demands several challenges in patients' daily life. Though implanted devices are life saving, however are a reminder that heart is not healthy. Needless to say, heart symbolizes the center

of emotions, therefore implantation of a cardiac device is frequently associated with psychological distress.¹⁴

According to literature review, anxiety and depression are frequently detected in ICD recipients and are attributed to several reasons such as disease chronicity, fear of sudden cardiac death and occurrence of sporadic ICD shocks. Anxiety and depression also vary with feelings of fear, helplessness, anger, insecurity, and uncertainty in the early post implantation stages while fear is most prevalent in post-discharge stage. As a consequence, they adversely affect patients' quality of life, thus illustrating the need for routine screening and appropriate psychological help. However, these individuals are reluctant to discuss depression symptoms for various reasons such as stigma of illness, perceived personal weakness and implications of having psychiatric illness written on their medical record.^{15,16}

Israleson et al.,¹⁵ showed that among 990 adults having an ICD, 15.5% and 7.4% experienced anxiety and depression, respectively. Frequency and intensity of shocks may promote anxiety and depression or deteriorate them if are already established. Bilge et al.,¹⁶ demonstrated that among ninety-one patients with implanted ICD, 42(46%) had anxiety and 37(41%) had depression.

According to Freedenberg et al.,¹⁷ ICD recipients, including those with heart failure, remain anxious and depressed 1 year after implantation. Moreover, ICD recipients who are younger, female, and receive ICD shocks are especially vulnerable to psychological distress. Shiga et al.,¹⁸ illustrated depression in approximately 30% of ICD patients and anxiety reports in 24–87% of ICD patients. Furthermore, the prevalence of posttraumatic stress disorder (PTSD) in ICD patients

reaches about 20% while type D personality, comorbidities, and frequent shocks may contribute to PTSD.

Palacios-Cena et al.,¹⁹ who supported that individuals encounter with several physical, psychological and social barriers, emphasized on the close relation between experience of ICD shocks and anxiety or depression. The more the delivered shocks then the more depressed the patient is. ICD shocks which are delivered when an arrhythmia is threatening, and are also associated with 2 to 5 fold increase in mortality, possibly attributed to deterioration of the underlying cardiac disease. Additionally, ICD shocks demand determination of etiology and elaborate evaluation of therapeutic intervention.⁸ Notably, ICD shocks can be classified into: a) objective shocks, which refer to the actual shock therapies that are recorded by the ICD and b) phantom shocks, where participants report sensations of shock but these are not recorded during ICD interrogations.⁹

Providing support is significant measure to alleviate symptoms of anxiety and depression. Zayac et al.,²⁰ in a literature review indicated the need for support for patients and their partners including behavioral and sexual counseling.

Rottmann et al.,²¹ illustrated that not only patients but also partners need psychological adjustment in the first year after ICD implantation. Aleman et al.,²² who explored 1550 individuals (19.5% female) living with an ICD with median age 67.3±9.8 years showed that living alone was the greatest predictor of low/medium support. Low social support for those living alone was associated with poorer perceived health status, symptoms of depression, and experiencing low perceived control.

The study conducted by Abbasi et al.,²³ who explored thirteen participants (seven men and six women) between the ages of 21 and 70 years old and showed the following predominant challenges in ICD recipients: living with fear, concerns about the future or about device malfunction, fear of death at the time of shock, pain due to shock, loss of control, cost of the device and lifestyle modifications. The researchers also illustrated that addressing the educational needs of both individuals with an ICD and their partners is an essential aspect of recovery.

In the literature are cited several differences regarding gender. Bilge et al.,¹⁶ illustrated the female gender along with shock frequency as precipitating factors for anxiety. Rahmawati et al.,²⁴ revealed that among Japanese patients with an ICD, women had a higher incidence of depression, according to the Beck Depression Inventory and worried more about their ICD than did men. Furthermore, women are experiencing several concerns about relationship issues which in turn adversely affect their quality of life. More in detail, female gender is associated with the experience for communication with patient groups, and family. In particular, when compared to male patients, the female, consider the need for communication to be more important, ask more questions, get more information, receive more counseling and have more participatory visits in health care services. In addition, a woman's identity as a caretaker and caregiver can be threatened by the perceived activity limitations imposed by the ICD or the underlying heart condition.²⁴⁻²⁸

Apart from all above issues, the impact of ICD therapy in women is unique since it is associated with scar and lump in the pectoral area. This visible scarring may

lead to body image concerns due to the emphasis women put on physical attractiveness. Changes in physical appearance affect body image in all ICD recipients but may be more intense in female. Electrophysiologists have described cosmetic approaches to device implantation that appear promising in female patients. The investigation of alternative device implant techniques is noteworthy and could improve quality of life, adjustment, and psychological fitness of female ICD recipients.^{9,27-30}

Reproductive and sexual health are also important issues, since 25 to 50% of ICDs patients report either concerns in this area or discomfort in discussing these areas with their health care providers. The attitude that women usually adopt, depends on various issues such as social support and roles, sexual and reproductive functioning. Finally, female patients should be provided sufficient time to make preoperative decisions, and family members should be engaged in decision making.²⁷⁻³⁰

An in-depth knowledge regarding ICD health related issues is becoming of major importance both in care planning and improving future care standards. Contrariwise, patients having insufficient knowledge regarding the ICD are experiencing various problems in their daily lives. Education and follow-up interventions increase knowledge levels, decrease anxiety and depression and improve quality of life.³¹⁻³⁵

Education about the device is not an overwhelming issue only for patients but also for nurses. According to Norekval et al.,³¹ nurses are unaware that mobile phones may affect the device (80%), that patients are restricted from driving (69%), and that ICDs deliver unintended shock therapy (73%). Similarly, Tagney³³ who explored knowledge about ICD in 152 nurses from cardiology departments showed that most of the participants had no confidence in their abilities either to prepare patients for implantation or to provide counseling about life at home. Additionally, knowledge of the device and its effects appeared poorly understood by all nurses. Nurses are aware of their deficits in care areas which are important to patients. However, they frequently report not having enough time to perform essential nursing tasks, such as addressing patients' anxiety, fears and concerns or providing patients and relatives with accurate information.

Finally, patients' orientated approach as an integral part of treatment is associated with better disease management and clinical outcomes and may increase patients' confidence regarding the device.³⁶

Conclusions

Based on all above findings, it is suggested that an in-depth understanding of ICD related issues is fundamental when developing appropriate tailored interventions which provide patients with a clear understanding of the rationale and limitations of the device.

References

1. Adabag AS, Luepker RV, Roger VL, Gersh BJ. Sudden cardiac death: epidemiology and risk factors. *Nat Rev Cardiol.* 2010;7(4):216–225.
2. Health Quality Ontario. Implantable cardioverter defibrillators. Prophylactic use: an evidence-based analysis. *Ont Health Technol Assess Ser.* 2005;5(14):1-74.
3. Kanoupakis E, Fanourgiakis J, Mavrakis H, Kallergis E, Simantirakis E, Crysostomakis S, et al. Long-term clinical outcomes in implantable cardioverter defibrillator recipients on the island of Crete *Hellenic Journal of Cardiology.* 2016;57(4): 247-252.
4. Kao CW, Chen MY, Chen TY, Lin PH. Effect of psycho-educational interventions on quality of life in patients with implantable cardioverter defibrillators: a meta-analysis of randomized controlled trials. *Health Qual Life Outcomes.* 2016;14(1):138.
5. Farwell D, Gollob MH. Risk stratification for sudden death in heart failure. *Minerva Cardioangiol.* 2007;55(3):379-384.
6. Arya A, Haghjoo M, Sadr-Ameli MA. Risk stratification for arrhythmic death after myocardial infarction: current perspective and future direction. *Int J Cardiol.* 2006;108(2):155-164.
7. Tagney J. A literature review comparing the experiences and emergent needs of adult patients with permanent pacemakers (PPMs) and implantable cardioverter defibrillators (ICDs). *J Clin Nurse.* 2010; 19(15-16):2081-2089.
8. Polikandrioti M, Tzirogiannis K, Zyga S, Koutelekos I, Vasilopoulos G, Theofilou P, Panoutsopoulos G. Effect of anxiety and depression on the fatigue of patients with a permanent pacemaker. *Arch Med Sci Atheroscler Dis.* 2018;3:e8–e17.
9. Ooi SL, He HG, Dong Y, Wang W. Perceptions and experiences of patients living with implantable cardioverter defibrillators: a systematic review and meta-synthesis. *Health Qual Life Outcomes.* 2016;14(1):160.
10. Johansson I, Stromberg A. Experiences of driving and driving restrictions in recipients with an implantable cardioverter defibrillator--the patient perspective. *J Cardiovasc Nurs.* 2010;25(6):E1-E10.
11. Shea JB. Quality of life issues in patients with implantable cardioverter defibrillators: driving, occupation, and recreation. *AACN Clin Issues.* 2004;15(3):478-489.
12. Mishkin J, Saxonhouse S, Woo G, Burkart T, Miles W, Conti J, et al. Appropriate evaluation and treatment of heart failure patients after implantable cardioverter defibrillator discharge : time to go beyond the initial shock. *J Am Coll Cardiol.* 2009;54(22):1993-2000.
13. Forman J, Baumbusch J, Jackson H, Lindenberg J, Shook A, Bashir J. Exploring the patients' experiences of living with a subcutaneous implantable cardioverter defibrillator. *Eur J Cardiovasc Nurs.* 2018;17(8):698-706.
14. Polikandrioti M, Tzirogiannis K, Zyga S, Koutelekos I, Vasilopoulos G, Theofilou P, et al. Effect of anxiety and depression on the fatigue of patients with a permanent pacemaker. *Archives of medical sciences. Atherosclerotic diseases.* 2018; 3: e8–e17.
15. Israleson J, Thylen I, Stromberg A, Bremer A, Arestedt K. Factors associated with health-related quality of life among cardiac arrest survivors treated with an implantable cardioverter-defibrillator. *Resuscitation.* 2018;132:78-84.
16. Bilge AK, Ozben B, Demircan S, Cinar M, Yilmaz E, Adalet K. Depression and anxiety status of patients with implantable cardioverter defibrillator and

- precipitating factors. *Pacing Clin Electrophysiol.* 2006;29(6):619-626.
17. Freedenberg V, Thomas SA, Friedmann E. Anxiety and depression in implanted cardioverter-defibrillator recipients and heart failure: a review. *Heart Fail Clin.* 2011;7(1):59-68.
 18. Shiga T, Suzuki T, Nishimura K. Psychological distress in patients with an implantable cardioverter defibrillator. *Journal of Arrhythmia.* 2013;29:10-313.
 19. Palacios-Cena D, Losa-Iglesias ME, Alvarez-Lopez C, Cachon-Perez M, Reyes Ra, Salvadores-Fuentes P, et al. Patients, intimate partners and family experiences of implantable cardioverter defibrillators: qualitative systematic review. *J Adv Nurs.* 2011; 67(12):2537-2550.
 20. Zayac S, Finch N. Recipients' of implanted cardioverter-defibrillators actual and perceived adaptation: a review of the literature. *J Am Acad Nurse Pract.* 2009; 21 (10):549-556.
 21. Rottmann N, Skov O, Andersen CM, Theuns DAMJ, Pedersen SS. Psychological distress in patients with an implantable cardioverter defibrillator and their partners. *J Psychosom Res.* 2018;113:16-21.
 22. Allemann H, Stromberg H, Thylen I. Perceived Social Support in Persons With Heart Failure Living With an Implantable Cardioverter Defibrillator: A Cross-sectional Explorative Study. *J Cardiovasc Nurs.* 2018;33(6):E1-E8.
 23. Abbasi M, Negarandeh R, Norouzadeh R, Shojae Mogadam AR. The Challenges of Living With an Implantable Cardioverter Defibrillator: A Qualitative Study. *Iran Red Crescent Med J.* 2016;18(10):e25158.
 24. Rahmawati A, Chishaki A, Sawatari H, Tsuchihashi-Makaya M, Ohtsuka Y, Nakai M, et al. Gender disparities in quality of life and psychological disturbance in patients with implantable cardioverter-defibrillators. *Circ J* 2013;77(5):1158-1165.
 25. Looi KL, Sidhu K, Cooper L, Dawson L, Slipper D, Gavin A, et al. Gender differences in the use of primary prevention ICDs in New Zealand patients with heart failure. *Heart Asia.* 2018;10(1):e010985
 26. Tomzik J, Koltermann KC, Zabel M, Willich SN, Reinhold T. Quality of Life in Patients with an Implantable Cardioverter Defibrillator: A Systematic Review. *Front Cardiovasc Med.* 2015;2:34.
 27. Steinke EE. Sexual concerns of patients and partners after an implantable cardioverter defibrillator. *Dimens Crit Care Nurs.* 2003;22(2):89-96.
 28. Walker R.L, Campbell K.A, Sears S.F, Glenn B.A, Sotile R, Curtis A.B, et al. Women and the implantable cardioverter defibrillator: A lifespan perspective on key psychosocial issues. *Clinical Cardiology.* 2004;27:543-546.
 29. Bertakis KD, Azari R. Patient-centered care: the influence of patient and resident physician gender and gender concordance in primary care. *J Womens Health (Larchmt).* 2012;21(3):326-333.
 30. Sowell LV, Kuhl EA, Sears SF, Klodell CT, Conti JB. Device implant technique and consideration of body image: specific procedures for implantable cardioverter defibrillators in female patients. *J Womens Health (Larchmt).* 2006;15(7):830-835.
 31. Norekval TM, Peersen LR, Seivaag K, Fridlund B, Wentzel -Larsen T. Temporal trends analysis of nurses' knowledge about implantable cardioverter defibrillators. *Nurs Crit Care.* 2015;20(3):146-154.
 32. Cinar FI, Tosun N, Kose S. Evaluation of an education and follow-up programme for implantable cardioverter defibrillator-implanted patients. *J Clin Res.* 2013;22(17-18):2474-2486.
 33. Tagney J. Can nurses in cardiology areas prepare patients for implantable cardioverter defibrillator

- implant and life at home? Nurse Crit Care. 2004;9(3):104-114.
34. West E, Barron DN, Reeves R. Overcoming the barriers to patient-centered care: time, tools and training. J Clin Nurs. 2005;14(4):435-443.
35. Elwyn G, Frosch DL, Kobrin S. Implementing shared decision-making: consider all the consequences. Implement Sci. 2016;11:114.
36. Polikandrioti M, Goudevenos J, Michalis LK, Koutelekos IG, Georgiadi E, Karakostas C, Elisaf M. Association Between Characteristics of Hospitalized Heart Failure Patients With Their Needs. Glob J Health Sci. 2015;8(6):95-108.