

To Switch off or not to Switch Off? Case Report and Ethical Issues on Defibrillator Deactivation in End-Of-Life Patients

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Abstract

The paper is aimed discussing ethical and technical issues related to claim of deactivation of the AICD in end-of-life patients on electrical storm. Starting from the case of a patient with AICD on electrical storm that asked for AICD deactivation, the ethics of AICD switching off are discussed. Particularly, the following points are discussed 1) Is the claim of the patient to deactivate the AICD legally and ethically valid? 2) What to do in a patient on electrical storm?

It is pointed out that the principia of autonomy or ownership of the device cannot be invoked to deactivate AICD because the patient is not legitimated to harm him/her-self. The frequent electric shocks cannot be regarded as futile because they prolong life; in fact, the clinical result of AICD switching-off is exactly got at the next following episode of ventricular arrhythmias, when the patient, no more protected by the AICD, dies. To turn-off the AICD may consequently be regarded as passive euthanasia.

In the authors' opinion, in front of an electrical storm, the physician must check and correct any possible reversible cause generating ventricular arrhythmias and, consequently AICD discharges, and, eventually, to sedate the patient. In fact, a seriously ill, in an end of life person who dramatically lives the extreme part of his life because of the frequent AICD shocks, could be, in our opinion, properly considered for terminal sedation instead to be given passive euthanasia.

Keywords: AICD; Electrical storm; Ethics; sedation; Switching off

Introduction

The clinical use of automatic implantable cardioverter defibrillator (AICD) is nowadays quite widespread and it is very probable that will increase in the next future due both to the general aging of the population and to the enlargement of the indications to AICD implantation [1].

AICD protects the life of patients against ventricular arrhythmias as ventricular tachycardia (VT) and ventricular fibrillation (VF) giving an electrical shock that is usually adverted as very painful [2].

In end-of-life patients, electrical storm (ES) often occur. ES is defined as 3 or more sustained episodes of VT or VF or appropriate shock of the AICD during a 24 hour period [3]. However, in some cases the frequency of shocks may increase so high that many shocks are given in few minutes like in our case. In such cases patients frequently ask for AICD switching off.

Some authors believe that in patients with terminal, untreatable heart failure as a cause of imminent death, may be reasonable to deactivate the AICD since any VT or VF may lead to sudden death without prolonging suffering [4].

The paper is aimed at discussing ethical and technical issues related to claim of deactivation of the AICD in end-of-life patients on ES because little interest has been paid, at this regard, in medical literature.

Case Report

A 63 old male patient with chronic ischemic cardiomyopathy and severe impairment of contractile function (left ventricular ejection fraction <30%), had an automatic implantable cardioverter-defibrillator (AICD) implanted 5 years before. He was hospitalized in intensive care unit for end-stage heart failure.

Fatigue, loss of appetite, low blood pressure and contraction of diuresis, despite medical therapy, let think to imminent death. The clinical picture was further complicated by the onset of six repeated episodes of VF, correctly recognized and stopped by AICD, in the span of few minutes. The frequent shocks of the device caused considerable distress to the patient that asked to physicians to turn off his AICD.

Due to severe hemodynamic instability, the patient died before any further treatment could be performed.

His quest for AICD deactivation, however, triggered an in depth reflexion on the ethical implications of such a claim and on the clinical and ethical managing of patients on ES.

Discussion

The questions which we attempted to give an answer is:

1. Is the claim of the patient to deactivate the AICD legally and ethically valid?

We believe it is not. Patients cannot claim the full right of ownership and decision on the device because they are not legitimated

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to harm them-selves [5]. Patients under ES cannot be considered fully free and able to understand the consequences of their decision [5]. For this reasons, all decisions and claims of patient, including the plea of switching off AICD, should be considered invalidated by the status of pain, fear and agitation [5]. Quests under ES cannot be considered valid neither from a legal nor from an ethical point of view [5]. Yet, physicians cannot be forced to perform an action against their personal medical and ethical principles [4-6].

Electrical therapy of AICD cannot be considered futile because the patient would die to next VT/VF, switching off AICD. Stopping a mortal arrhythmias is not a futile treatment [5]. Switching off AICD may be rightly called as passive euthanasia because it means removing a barrier to death [7]. In fact, the next arrhythmia after AICD deactivation will be fatal because the device will not stop it. The patient's death is consequently caused by a voluntary omission [5].

2. What to do in patient on ES?

Management of ES requires many approaches [3]. The most important step is obviously to reverse causative factor of ES (ischemia, worsening heart failure, hypokalemia, hypomagnesemia, acidosis, hypovolemia, arrhythmogenic drugs, hyperthyroidism, infection, fever). The correction of the imbalance often allows the return to electrical stability [3,8]. Another step is treatment of VT or VF with antiarrhythmic drugs and/or RF catheter ablation [3]. Beta-blockers play a key role in the management of the ES [3]. Programming AICD to deliver anti-tachycardia pacing (ATP) for fast VT can reduce the need for shocks; rapid pacing often terminates fast VT [3].

In our opinion, all end-of-life patients with refractory and painful ES should be sedated, and not exposed to death switching off AICD [5].

The presence of refractory symptoms is a necessary condition for an ethically defensible initiation of sedation at the end of life [9]. A symptom is regarded as being refractory when the clinician perceives that further invasive or non-invasive interventions are 1) incapable of providing adequate relief, 2) associated with excessive and intolerable acute or chronic morbidity, 3) and/or unlikely to provide relief within a tolerable time frame [9].

Palliative sedation therapy is the use of specific sedative medications to relieve intolerable suffering from refractory symptoms by a reduction in patient consciousness [10,11]. The relief of suffering is achieved by reducing the level of consciousness so as to reduce the awareness of the distress to a tolerable level [13]. There are not data in literature on how sedating a patient in end-of-life and in ES. Most centers use midazolam for palliative sedation in end-of-life patients because of the drug's short half-life, the moderate adverse effects, the ease intravenous or subcutaneous administration and the generally good efficacy [11]. Propofol is used in patients refractory to opioids and midazolam [11]. Clinicians should use the minimal dose of sedatives needed to achieve acceptable relief of suffering [11]. It is important to stress that the use of such drugs may result useful not only in pain relief but also in treating the arrhythmia: short-acting anesthetic such as propofol and benzodiazepines have been associated with the suppression of VT, because of the physical and emotional stress that patient experiences on ES perpetuate arrhythmias [3,12].

The intent of palliative sedation is the relief of unremitting and intractable suffering achieved by sedation, whereas the intent of physician-assisted suicide and euthanasia is the termination of the patient's life [11,13].

Another point of discussion is whether or not the informed consent form signed by the patient at AICD implantation should considerate the case of very frequent electrical discharges at the end of life and whether or not the patient could previously indicate his willing in the case that electrical storm occurs. In the former case the informed consent form should assume the meaning of a biological legacy too. For the above discussed reasons we believe that the informed consent form should address this point specifying that, in the case of electric storm, the pain will be controlled with an appropriate sedation.

References

1. Epstein AE, Dimarco JP, Ellenbogen KA, Mark Estes NA, Leonard S. Gettes, et al. (2008) ACC/AHA/HRS guidelines for device-based therapy of cardiac rhythm abnormalities: executive summary – a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to revise the ACC/AHA/NASPE 2002 Guideline Update for Implantation of Cardiac Pacemakers and Antiarrhythmia devices) developed in collaboration with the American Association of Thoracic Surgery and Society of Thoracic Surgeons. *Heart Rhythm* 5: 934–955.
2. Pycha C, Gullledge AD, Hutzler J, Kadri N, Maloney J (1986) Psychological responses to the implantable defibrillator: preliminary observations. *Psychosomatics* 27: 841–845.
3. Eifling M, Razavi M, Massumi A (2011) The evaluation and management of electrical storm. *Tex Heart Inst J* 38: 111-121
4. Padeletti L, Arnar DO, Boncinelli L, Brachman J, Camm JA, et al. (2010) European Heart Rhythm Association, Heart Rhythm Society. EHRA Expert Consensus Statement on the management of cardiovascular implantable electronic devices in patients nearing end of life or requesting withdrawal of therapy. *Europace* 12: 1480–1489.
5. Facciorusso A, Stanislao M, Fanelli M, Valori VM, Valle G (2011) Ethical issues on defibrillator deactivation in end-of-life patients. *J Cardiovasc Med* 12: 498-500
6. Pellegrino ED (2000) Decisions to withdraw life-sustaining treatment: a moral algorithm. *JAMA* 283: 1065–1067.
7. Ross M (2005) Deactivating implantable cardioverter defibrillator. *Ann Intern Med* 143: 690.
8. Hunt SA (2005) American College of Cardiology, American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to update the 2001 Guidelines for the Evaluation and Management of Heart Failure). *J Am Coll Cardiol* 46: e1–e82.
9. Juth N, Lindblad A, Lynöe N, Sjöstrand M, Helgesson G (2010) European Association for Palliative Care (EAPC) framework for palliative sedation: an ethical discussion. *BMC Palliat Care* 9: 20.
10. de Graeff A, Dean M (2007) Palliative sedation therapy in the last weeks of life: a literature review and recommendations for standards. *J Palliat Med* 10: 67-85.
11. Olsen ML, Swetz KM, Mueller PS (2010) Ethical decision making with end-of-life care: palliative sedation and withholding or withdrawing life-sustaining treatments. *Mayo Clin Proc* 85: 949-954
12. Burjorjee JE, Milne B (2002) Propofol for electrical storm; a case report of cardioversion and suppression of ventricular tachycardia by propofol. *Can J Anesth* 49: 973–977
13. Kirk TW, Mahon MM (2010) Palliative Sedation Task Force of the National Hospice and Palliative Care Organization Ethics Committee. National Hospice and Palliative Care Organization (NHPCO) position statement and commentary on the use of palliative sedation in imminently dying terminally ill patients. *J Pain Symptom Manage* 39: 914–923.