On the causes of ventricular arrhythmia, its treatment and outcome

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This thesis is based on the following papers:

I. Presumed arrhythmic death in consecutive survivors of acute myocardial infarction--implications for primary implantable cardioverter defibrillator implantation
Holmgren CM, Nyström BM, Karlsson TK, Herlitz JD, Edvardsson NG.
Coron Artery Dis. 2009 Mar;20(2):155-62

II. Analysis of initial rhythm, witnessed status and delay to treatment among survivors of out-of-hospital cardiac arrest in Sweden
Holmgren C, Bergfeldt L, Edvardsson N, Karlsson T, Lindqvist J, Silfverstolpe J, Svensson L, Herlitz J.
Heart. 2010 Nov;96(22):1826-30. Epub 2010 Oct 3.

III. Risk of interference from transcutaneous electrical nerve stimulation on the sensing function of implantable defibrillators
Holmgren C, Carlsson T, Mannheimer C, Edvardsson N.
Pacing Clin Electrophysiol. 2008 Feb;31(2):151-8.

IV. Recent changes in medication in out-of-hospital cardiac arrest victims
Holmgren C, Abdon NJ, Bergfeldt L, Edvardsson N, Herlitz J, Svensson L, Åstrand B
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ABSTRACT

Background: Ventricular arrhythmia is the most common aetiology of sudden cardiac death. Death can sometimes be prevented by the implantation of a defibrillator (ICD). When an out-of-hospital cardiac arrest (OHCA) has occurred some circumstances characterize those who survive. Medication used to treat disease is not always harmless.
Methods: The population in the Swedish Cardiac Arrest Register was used to characterize the survivors, and for the recently added drugs, before an OHCA, used together with the Swedish Prescribed Drug Register. The outcome of all consecutive acute myocardial infarction patients during 21 month time at Sahlgrenska University Hospital was investigated to determine if a simple echocardiographic criterion could identify the patients that would die of arrhythmia during two years after the myocardial infarction. Thirty patients with an implanted defibrillator were tested with Transcutaneous Electrical Nerve Stimulation (TENS) to determine the risk of electrical interference with the ICD.
Results: The echocardiographic criterion of an ejection fraction ≤30% alone, found only three of the patients who died of presumed arrhythmia and only one of them would have been implanted with an ICD in clinical practice. Six patients who died of presumed arrhythmia had a better ejection fraction. The TENS interfered with 16/30 ICDs. Among survivors of OHCA 20% were from the group found in a non-shockable rhythm and the majority was not reached by the ambulance within five minutes. Recently added drugs before OHCA were most often prescribed for infectious, respiratory and neuro-psychological diseases. 16.2% of the OCHA victims had recently claimed a drug from the" qtdrugs.org" lists
.Conclusion: Better criteria or combinations are needed to identify the patients that would benefit from an ICD on a primary prevention indication after myocardial infarction. The TENS device cannot be recommended to be used simultaneously with an ICD and protocols for testing other implantable devices to be used together with an ICD are warranted. New drugs frequently claimed before OHCA should be further investigated and the OHCA victims found in non-shockable rhythm need more attention. The delay-time for ambulance arrival to the OHCA victim is long.

Keywords: Cardiac arrest, ICD, ventricular arrhythmia
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