Navigating complexities in implantable cardioverter-defibrillator therapy: insights, challenges, and patient-centred approaches

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Chapter 8

Summary, conclusions and future perspectives

This thesis explores the importance and challenges of patient-centered approaches in ICD therapy. The thesis captures shared decision-making in the contemporary and ageing Dutch ICD patient population, emphasizing the importance of patient-centered care and informed shared decision making of patients and clinicians when it comes to guiding ICD implantation and pulse generator exchange related choices. It addresses barriers to ICD therapy utilization in older patients and advocates for thorough patient selection, taking into account not only the primary cardiac status, but also the growing comorbidities and evolving patient's values. The thesis discusses some of the ethical considerations in end-of-life care of patients with an ICD, advocating for timely advanced care planning discussions and interdisciplinary collaboration to reflect patient preferences. Furthermore, this thesis examines the clinical outcomes of subcutaneous versus transvenous ICD therapy, highlighting some of the advantages of subcutaneous devices in terms of safety and lead related complications. Additionally, it investigates the impact of chronic total coronary occlusion on ventricular arrhythmias and mortality, offering insights into tailored interventions and risk stratification strategies for patients with ischemic heart disease.

Chapter 2 of the thesis focused on the technical aspects of ICD therapy, comparing the long-term clinical outcomes of subcutaneous versus transvenous ICD therapy. The study found that both types of ICDs were effective in reducing the risk of SCD, but that subcutaneous ICD therapy was associated with a lower risk of device-related complications such as infection and lead failure. The chapter also discussed the practical considerations of device selection, including patient and cardiac condition specific characteristics, indication for therapy, expected chance of anti-tachy pacing and the potential risks and benefits of each type of device.

Chapter 3 of the thesis evaluated the impact of a chronic total coronary occlusion on ventricular arrhythmias and long-term mortality in patients with ischemic cardiomyopathy and an ICD. The study found that the presence of a chronic total coronary occlusion was associated with an increased risk of ventricular arrhythmias and long-term mortality in this patient population. The chapter discussed the implications of these findings for the clinical management of patients with ischemic cardiomyopathy and an ICD, including the potential benefits of revascularization in reducing the risk of ventricular arrhythmias .

Chapter 4A of the thesis examined the risk of painful shocks in the last moments of life in patients with an ICD. It reports that patients with an ICD remain at risk for painful shocks in the last moments of life, even when the device is

programmed to minimize the risk of inappropriate shocks. The chapter discusses the ethical implications of ICD therapy in end-of-life care, including the need for careful consideration of patient preferences and values in decision-making and timely tachytherapy deactivation.

Chapter 4B of this thesis investigated the causes of death in patients who had their tachytherapy deactivated in a large population over a decade. The research focused on patients who received an ICD and examined the practice of tachytherapy deactivation, the mode of death, and the diversification of causes of death over time. The study emphasized the need for advanced care planning to avoid painful shocks and stress during patients' last moments of life, highlighting the importance of awareness among (primary) care providers.

Chapter 5 of the thesis investigated the use of ICD therapy in older patients in the Dutch clinical practice. The study found that ICD therapy was underutilized in older patients, despite evidence of its effectiveness in this population. The chapter discussed the factors that may contribute to the restricted use of ICD therapy in older patients, including age bias, competing health risks, and the potential impact on quality of life.

Chapter 6 of the thesis reported on the development of a decision aid for shared decision-making in the Dutch ICD patient population. This novel approach to patient education provided a structured and systematic process for patients and clinicians to discuss the benefits and risks of ICD therapy, including the potential impact on quality of life and the risks of complications such as painful shocks. The decision aid was developed using a patient-centered approach, involving patients, clinicians, and researchers in the development and evaluation process. The chapter discussed the potential of the decision aid in improving patient knowledge and satisfaction with the decision-making process.

Chapter 7 of this thesis reports the results of the randomized controlled trial that aimed to evaluate the use of a decision aid for patients undergoing an elective pulse generator exchange for their ICD and assessed shared decision making levels, decisional conflict, and knowledge before and after the intervention. Experienced shared decision making levels did not differ between the study groups for both patients and caregivers. The degree of decisional conflict was also similar in patient who did and did not use the decision aid. Despite these outcomes, the trial contributed to standardizing care and patient information within the country, with an online accessible platform endorsed by the Dutch Society of Cardiology.

In summary, this thesis contributes to our understanding of ICD therapy and its optimal patient-tailored implementation, emphasizing evidence-based practice, patient-centered care, and interdisciplinary collaboration in optimizing clinical and patient-oriented outcomes.

Future perspectives

Personalized decision-making

Further research is needed to investigate the impact of personalized decision-making tools on patient perceived as well as hard clinical outcomes. By incorporating patient-specific factors such as comorbidities, frailty, and patient values and preferences, decision-making can be tailored to the individual patient's needs and look beyond the primary cardiac indication.

Advancements in technology

As technology continues to evolve, there is an opportunity to improve the technical aspects of ICD therapy. For example, the further development of leadless ICDs may further reduce the risk of complications such as infection and lead failure. Additionally, advancements in remote monitoring technology may improve patient outcomes by allowing for earlier detection of device/ lead malfunctions, arrhythmias and worsening heart failure.

End-of-life care

There is a need for further research into the ethical implications of ICD therapy in end-of-life care. Specifically, there is a need for practical guidelines and decision-making tools to help clinicians and patients navigate the difficult decisions surrounding deactivation of ICD therapy. This is especially the case for the frail and elderly, but also for specific groups such as patients with advance heart failure and those on left ventricular assist device support.

Age selection

The selection approach of ICD therapy in older patients, as highlighted in this thesis, underscores the need to address age bias in clinical decision-making and make a careful weighting against the expected benefit. Holistic patient assessment approaches (e.g. including frailty scores) can help gain thorough understanding of a patient’s both somatic and functional status.

Collaboration between disciplines

The findings of this thesis highlight the importance of a multidisciplinary approach to the management of patients with a high risk of SCD. Collaboration between cardiologists (amongst others rhythm (device) and heart failure specialists), geriatricians, general practitioners and even palliative care specialists can help ensure that patients receive comprehensive, individualized care that addresses their unique needs and preferences.

Patient education and empowerment

This thesis highlights the importance of patient education in improving shared decision-making and reducing decisional conflict. Future research should investigate the most effective methods of patient education and empowerment, including the use of multimedia and interactive (virtual reality) tools.

Revascularization in ischemic cardiomyopathy

The findings suggest that revascularization of a chronic total occlusion may reduce the risk of ventricular arrhythmias and improve long-term outcomes in patients with ischemic cardiomyopathy and an ICD. Further research is needed to investigate the optimal timing and method of revascularization in this patient population.