

Peer Review File

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Reviewer A

The authors report on the impact of pre-existing AF prior to CRT or ICD implant in their prospective registry. They describe that patients with AF differ from those without AF, as well as the adverse outcome associated with AF.

Overall, the data does yield any novelty, but large prospective registries are scarce and therefore the data may be clinically useful. However, the authors only performed limited statistical analysis and report limited data.

Comments:

1. The methods are incomplete. The follow-up requires better description. Where patients contacted at regular time intervals? How was diagnosis verified, only by patient contact or also medical records?

Reply: Many thanks to the reviewer for this important query, which helps us to better explain the described methodology for readers. The patients were regularly contacted only after 12 months. In the case of hospital treatment, patients were asked to provide relevant medical documentation in order to be able to understand diagnoses, therapies and events.

Changes in the text: A corresponding section has been included in the methodology under “Follow-up”.

2. The baseline measurements need more info. What were the standard requirements for echocardiography and ECG? How was LVEF calculated? Only echo or also cardiac MRI?

Reply: We thank the reviewer for this important comment. All patients received a 12-lead ECG on the day of admission before implantation, which was evaluated by the respective center. In addition, echocardiography was performed before implantation in every case. The echocardiography was also carried out and reported by the treating center according to the respective standards. The corresponding minimum requirements for this study have also been added to the methodology.

Changes in the text: The implementation and interpretation of echocardiography and ECG have been added to the methodology under “Data Collection”.

3. The patient selection is a little dubious. In the tekst patients with Brugade and LQTS are described, but these are not mentioned in the table. Also, given their underlying pathophysiology it would be better to limit the study population to ischemic and dilated CMP.

Reply: Thank you for this comment. Taking into account the other reviewer comments, we decided to clean up the patient group to be analyzed and carried out a completely new data analysis. We also took the reviewer's important note into account and limited ourselves to patients with ischemic, dilated and hypertrophic cardiomyopathy to ensure an unbiased analysis.

Changes in the text: New data-analysis as presented in the results. Removal of the relevant patient groups from the analysis and text.

4. The Kaplan-Meier graphs are not available in the file I reviewed.

Reply: Thank you. An Odds Ratio Plot and Kaplan-Meier estimate of the revised analysis are available in the “figures” document attached in our revised-submission.

Changes in the text: An Odds Ratio Plot and Kaplan-Meier estimate of the revised analysis are available in the “figures” document attached in our revised-submission.

5. Even though the authors report only 1-year follow-up data, the true impact of AF at baseline requires a multivariable Cox regression analysis.

Reply: Many thanks to the reviewer for this important comment that increases the data quality. We have added a calculation of hazard ratios adjusted for age, sex, NYHA III+, LVEF <30%, implantation for secondary prevention, QRS >120ms, CHD, Diabetes, chronic kidney disease and COPD to further analyse the true impact of atrial fibrillation on mortality and icd-shocks.

Changes in the text: The relevant passages were adapted to the results and discussion section in the manuscript after the new analysis. In addition, Figure 1 was created and inserted to graphically display the results of the analysis according to adjustment for age, sex, NYHA III+, EF <30%, implantation for secondary prevention, QRS >120ms, CHD, diabetes, CKD and COPD.

6. Were medication profiles available?

Reply: We would like to thank the reviewer for this important request. Medication profiles for specific medications were collected as part of the registry and appended to the manuscript as Table 3.

Changes in the text: We added a selection of the patient medication at discharge after device implantation as table 3 to the manuscript.

7. Was the diagnosis of AF based only on ECG or also medical history?

Reply: Thank you for this request. The basic diagnosis of atrial fibrillation was also determined from the medical history. However, information about atrial fibrillation or sinus rhythm at the time of the actual device implantation was also obtained from ECG and used for the data analysis.

Changes in the text: A corresponding note has been added to the methodology under “Data Collection”.

Reviewer B

The authors have taken a look at a population of patients at risk for bad outcomes and then focused on the patients with atrial fibrillation and discovered that these patients were also patients with many other comorbid conditions. Not surprisingly the more sick patients had worse outcomes. If we could control for the many known comorbid conditions and the unrecognized comorbid conditions then we could make some conclusions about the patients with atrial fibrillation. Or if we had a randomized trial of an intervention that changed the amount of atrial fibrillation then we could understand the impact of AF on these poor outcomes. Perhaps propensity matching in the groups could help with the manifest differences in the groups. This article could have been written from the standpoint of LVEF or other diseases and you would have found that there was more AF in low EF patients and that they did worse.

Reply: We would like to thank the reviewer, who made an important and completely correct contribution to improving our manuscript with this comment. We have taken this advice into account and, on this basis, have carried out a completely new analysis of the data. First, we carried out a comparison analysis separately for pure ICD and CRT-D. The overall evaluation now only includes patients with a device with a defibrillator function. Due to the exclusion of CRT-P and the exclusion of patients with Brugada, ARVC, etc. following the advice of another reviewer, the number of patients has decreased somewhat compared to the first draft. In the interests of consistency, however, this overall collective seems to make the most sense for the analysis. Furthermore, we have added a calculation of hazard ratios adjusted for age, sex, NYHA III+, LVEF <30%, implantation for secondary prevention, QRS >120ms, CHD, Diabetes, chronic kidney disease and COPD to further analyse the true impact of atrial fibrillation on mortality and icd shocks. We found, that the impact of AF on icd shocks and mortality persisted, even after adjusting for the parameters mentioned before. We have extensively edited the Results and Discussion sections based on the additional analysis and have included Tables 6 and 7 with the corresponding results. In addition, Figure 1 shows the adjusted hazard/odds ratios.

Changes in the text: We have extensively edited and marked the Results and Discussion sections based on the additional analysis and have included Tables 6 and 7 with the corresponding results. In addition, Figure 1 shows the adjusted hazard/odds ratios.

Reviewer C

Feickert et al. performed a retrospective analysis of a prospectively maintained registry of patients in Germany who underwent ICD / CRT device implant or device change to evaluate the association of AF on comorbidity profile, and the impact of AF on peri-procedural and 1 year outcomes. They showed that patients with AF at the time of implant / device change were older, were more comorbid and had reduced LV systolic function, compared with sinus rhythm. Patients with AF also had a higher mortality at 1-year follow-up and statistically significantly worse peri-procedural outcomes.

It is a well-written and concise study. My reservation about this study is what new information it provides, and the interpretation of the outcomes. It is well-recognized that patients with AF are older and more comorbid. The association of AF and peri-procedural and 1-year outcomes have not been adjusted to for age and comorbidities.

1. This study requires at the very least a propensity matched analysis between patients in AF and sinus rhythm adjusting for age, comorbidities (e.g. diabetes, LVEF<30%, chronic kidney disease, peripheral vascular disease) to compare the peri-procedural and 1 year outcomes between groups

Reply: Our gratitude goes to the reviewer whose insightful and accurate feedback significantly enhanced our manuscript. Heeding this guidance, we conducted a thorough reanalysis of our data. Initially, we separately compared pure ICD and CRT-D cases. Now, our collective assessment focuses solely on patients equipped with a defibrillator device. This change, influenced by another reviewer's suggestion, led to the omission of CRT-P patients and those diagnosed with Brugada, ARVC, etc., slightly reducing our patient count from the initial draft. However, for the sake of coherence, this refined patient group appears more appropriate for our analysis. Additionally, we included a computation of hazard ratios adjusted for variables like age, gender, NYHA III+ status, LVEF under 30%, secondary prevention implantations, QRS duration over 120ms, CHD, diabetes, chronic kidney disease, and COPD. This was to better discern atrial fibrillation's true effect on mortality and ICD shocks. Our findings reveal that atrial fibrillation's influence on ICD shocks and mortality remains significant, even after adjusting for the aforementioned factors. We have substantially revised the Results and Discussion sections to reflect these new findings, incorporating Tables 6 and 7 which detail these outcomes. Furthermore, Figure 1 illustrates the adjusted hazard/odds ratios.

Changes in the Text: The Results and Discussion sections of our manuscript have undergone significant revisions in light of the supplementary analysis. The corresponding changes in the text are marked. We have also incorporated Tables 6 and 7, which present the relevant findings. Moreover, Figure 1 has been included to display the adjusted hazard/odds ratios.

2. Patients with AF received a significantly higher rate of shock therapy compared with patients in sinus rhythm. Can the authors elaborate on the shock therapy as to what the underlying rhythm was at AICD check was? It would be interesting to know whether patients were receiving shock therapy for AF with RVR as opposed to VT or VF.

Reply: Many thanks to the reviewer for this important and interesting question. Unfortunately, we only have small and incomplete information and data on the heart rhythm during shock delivery, meaning that an adequate analysis of this important information in this collective is not possible. We tried to shed light on this topic in the discussion and discussed possible mechanisms for the phenomenon of inappropriate shock delivery.

Changes in the text: A short passage on inappropriate shock delivery and possible influencing factors was added to the "discussion".

3. In the AF patient group, what proportion of the time are they in AF on device check follow-up? What proportion of patients had an atrial lead inserted at time of device implant?

We would like to thank the reviewer for this important query. Unfortunately, as mentioned in the methods of our manuscript, the only data available regarding the 12-month follow-up for this work, was collected on the basis of a telephone consultation with the patient and any documents provided in the event of hospitalization or other hospital treatment. Unfortunately, a standard device interrogation after 12 months is not available in many cases. Information on the number of leads of the devices can now be seen in Table 1. We have mentioned the possible influence of the number of leads on the incidence of inappropriate shocks in the discussion, but cannot provide precise information on this because in many cases we do not know the heart rhythm at the time of shock delivery.

Changes in the text: A short passage on inappropriate shock delivery and possible influencing factors was added to the "discussion". Furthermore, information on the number of leads implanted in sole ICD patients has been added to table 1.

4. Page 12, line 21 – “rate of inadequate shocks” – I presume the authors mean inappropriate shocks

Reply: The reviewer is absolutely correct, thank you for bringing this to our attention. We adapted this wording throughout the manuscript.

Changes in the text: The wording “inadequate shocks” was changed to “inappropriate shocks” throughout the manuscript.

5. How many patients in the sinus rhythm developed AF during follow-up on device check? Is this accounted for in your between-group analyses?

This is an interesting question. We thank the reviewer for this. The main subject of the study in this manuscript was the influence of atrial fibrillation or sinus rhythm in the admission ECG on the inpatient course and the 1-year outcome. This question served as the basis for our data analysis and the corresponding conclusions. The new onset of atrial fibrillation was inquired about in telephone contact after 1 year. However, since it was based exclusively on the statements of the patients or reviewed medical records of the period and not based on a uniform device interrogation in all patients after one year, this information was not taken into account in the statistical analysis.