Targeting maximal doses of beta-blockers in patients with heart failure with reduced ejection fraction and cardiac implantable electronic devices – a registry-based study

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Introduction: Cardiac implantable electronic devices (CIEDs), including implantable cardioverter-defibrillators (ICDs) and cardiac resynchronization therapy devices (CRTs), alongside optimal medical therapy (OMT), have been a cornerstone of treatment of heart failure with reduced ejection fraction (HFrEF)[1]. Up-titration of OMT, which includes beta-blockers (BB), is an irreplaceable step in treatment and prevention of sudden cardiac death SCD[2]. However, previous studies have shown that HFrEF patients often fail to reach target doses of OMT[3]. This study aimed to assess whether patients with ICDs and CRTs reach maximal doses of BB.

Patients and Methods: This was an observational, registry-based study that included patients with HFrEF who had ICD or CRT implanted in our institution from January 2021 to September 2024. Data was extracted from the CaRD registry (NCT06090591).

Results: This registry-based study included 166 patients with a median age of 64 (IQR 59-68), 81% male. All patients had BB prescribed, most often bisoprolol (74% and 59% in the ICD and CRT groups, respectively), followed by carvedilol in the ICD group (10%) and nebivolol in the CRT group (17%). Maximal doses of BB were reached in only 13% of patients prior to ICD implantation and in 12% of patients before CRT implantation. After the implantation of CIEDs, up-titration of BBs to maximal doses has not improved significantly (13 vs. 16% patients in the ICD group, p=0.206; 12 vs. 22% of patients in the CRT group, p=1.404). Most common reasons for lack of up-titration of BBs were clinician inertia (44% of patients in the ICD group and 35% of patients in the CRT group) and intolerance of higher doses (36% of patients with ICD and 38% of patients with CRTs), mostly due to arterial hypotension. In only 4% of patients in both groups, the maximal dose of BBs was not reached due to patient non-adherence.

Conclusion: Our findings highlight the need for continuing efforts in titrating BBs to their target doses, especially in order to minimize clinician inertia.

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