

Appropriate shocks in WCD patients - Results from the Austrian WCD registry

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Background: The wearable cardioverter-defibrillator (WCD) is a temporary treatment option for patients at high risk for sudden cardiac death (SCD) and/or for patients in whom implantation of a cardioverter defibrillator (ICD) is temporarily not possible.

Purpose: To investigate incidence and predictors of appropriate WCD shocks.

Methods: We performed a retrospective analysis of all patients with appropriate shocks delivered by a WCD in the cohort of the Austrian WCD registry between 2010 and 2018. Within this dataset, we identified predictors within the baseline characteristics, the indication for the WCD and preceding alarms automatically recorded by the WCD.

Results: Baseline: Within 879 registered in the Austrian WCD registry, 31 patients (3,5%) received appropriate WCD shocks due to ventricular tachycardia (VT) or ventricular fibrillation (VF). Compared to the total cohort, shocked patients were elder (mean age 67 ± 14 vs. 60 ± 14 years, $p = 0,001$) and the percentage of female patients was lower (11% vs. 21%, $p = 0,262$). The mean baseline LVEF at prescription was $33 \pm 15\%$ in the population with appropriate shocks compared to $32 \pm 14\%$ in the all-over cohort ($p = ns$).

In the Austrian WCD population, 378/879 patients had a WCD due to secondary prevention. Within this cohort 5,6% (21/378) had shocks for VT/VF again, compared to 10/501 (2%) shocked patients in the primary prevention cohort. 31/879 (3.5%) patients received 57 appropriate shocks, the per patient shock rate was 2 [1;5]. These shocks were induced by 25 ventricular tachycardia and 26 times ventricular fibrillation.

The octogenarians with 11% (7/34) shocked patients, showed a significant higher likelihood to receive shocks ($p = 0,008$) as well as the cohort of secondary preventive prescribed WCD-patients ($p = 0,007$). There were more shocks in patients, when prescribed with a WCD due to ICD associated infections ($p = 0,001$), when used as a bridge to ICD ($p = 0,042$) and in patients with ongoing risk stratification ($p = 0,009$).

Looking through the automatically recorded alarms preceding a WCD shock, shocked patients experienced significantly more often non sustained VTs ($p < 0,0005$) and sustained VTs that were haemodynamically tolerated and did not require a treatment ($p < 0,0005$).

Conclusion: The WCD is effective in preventing SCD and an important risk stratification tool. We identified advanced age, patients with either already confirmed indication for ICD implantation (either temporary contraindication for implantation or temporary explantation) or risk stratification of an unclear cardiomyopathy, the cohort of secondary prevention and preceding nsVTs and stable VTs as predictors for appropriate WCD therapies.