

CORRESPONDENCE

Letters to the Editor

Implantable Cardioverter-Defibrillator Shocks and Their Adverse Impact on Patient-Centered Outcomes: Fact or Fiction?

In a recent issue of the *Journal*, Daubert et al. (1) reported the impact of inappropriate implantable cardioverter-defibrillator (ICD) shocks on health outcomes in the MADIT II (Multicenter Automatic Defibrillator Trial II). The incidence of 1 or more inappropriate shocks was 11.5%, inappropriate shocks comprised 31.2% of all shock episodes, and inappropriate shocks predicted a 2-fold increased mortality risk. In their conclusions, the authors refer to the potential detrimental effects of inappropriate shocks on quality of life but also state that this association is not yet established. In an accompanying editorial, Dr. Raitt (2) also refers to the effect of shocks on patient-centered outcomes such as quality of life and psychological distress.

However, the majority of references cited to substantiate this impact of shocks on patient-centered outcomes were published more than a decade ago (3–6). What is more, neither Daubert et al. (1) nor Raitt (2) cite any studies that failed to find a relationship between shocks and patient-centered outcomes, although these data are available (7–12). Differences in study design and the way that shocks were assessed (e.g., self-report vs. objectively measured) and quantified (e.g., shocks/no shocks vs. number of shocks) may in part explain these mixed findings. For example, in the Canadian Implantable Defibrillator Study there was a dose-response relationship, with only patients experiencing ≥ 5 shocks being at risk for impaired quality of life (13).

Alternatively, the inconsistency in findings may be attributed to whether factors that may potentially compete with shocks as a determinant of outcome were accounted for. Sears et al. (14) showed that although shocks had a significant effect on quality of life, this effect was relatively small compared with that of psychological factors such as optimism, trait-anxiety, history of depression, and social support. We showed that device-related concerns and Type D personality (i.e., tendency to experience negative emotions and to inhibit self-expression) had a greater effect on anxiety and depression after ICD implantation compared with shocks (15). In another study, we found that anxiety and depression levels were higher in nonshocked Type D patients than in shocked non-Type D patients, indicating that personality factors may play a substantial role in this context (9).

Taken together, it seems fair to conclude that research on shocks and patient-centered outcomes has produced inconsistent findings and that other factors may be equally (or even more) important in predicting these outcomes after ICD implantation. With changes in ICD programming and the use of new antitachycardia pacing therapies (16) leading to a reduction in shocks and better quality of life (17), it may be time for a paradigm shift that

includes looking at the role of other factors in addition to shocks. The ICD shocks may indeed be a “double-edged sword” in terms of their adverse impact on prognosis (2), but their impact on patient-centered outcomes may be more benign than generally assumed. From a clinical perspective, this observation does not imply that shocks are not important in terms of patient-centered outcomes, but rather that the ICD patient’s psychological profile is of major importance.

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Reply

We thank Dr. Pedersen and Ms. van den Broek for their interest regarding our recent article (1) and for drawing attention to the potential quality-of-life issues associated with implantable cardioverter-defibrillator (ICD) shocks. The authors emphasize that the relationship between ICD shocks, appropriate or inappropriate, and health-related quality of life is neither simple nor linear. For example, some studies have not found an effect of shocks on quality of life. Other studies either have (2) or have not (3) found an effect between number of shocks and adverse psychologic effect. Similarly, patients with multiple appropriate shocks, for example, ventricular arrhythmia storm, appear to be at particularly high risk for subsequent, largely nonsudden, death in follow-up (4). Patient-related factors such as age or personality type likely do play a role in the magnitude of effect a shock has on the patient (1,5,6). In MADIT II (Multicenter Automatic Defibrillator Trial II), while personality subtypes, such as type D (7), were not specifically inventoried or analyzed (8), mental health was not observed to change in patients completing follow-up quality-of-life questionnaires, although declines in physical health were noted for patients experiencing appropriate shocks, likely due to worsening congestive heart failure (9). In summary, further work is needed to reduce the occurrence of ICD shocks, both appropriate and inappropriate, while maintaining the mortality reduction with ICDs, and to anticipate, understand, and mitigate the effects of the shocks when they cannot be prevented.

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Initial Assessment of Clinical Impact of a Drug Interaction Between Clopidogrel and Proton Pump Inhibitors

After reading the article by Gilard et al. (1) regarding the influence of omeprazole on the antiplatelet action of clopidogrel associated with aspirin, we examined our medical and pharmacy databases for acute myocardial infarction (MI) rates in members receiving clopidogrel with or without concurrent proton pump inhibitor (PPI) therapy.

Our analysis included members younger than age 65 years who were determined to be adherent to clopidogrel therapy. Members were assigned to a no PPI exposure group (control), low PPI exposure group, or high PPI exposure group based on adherence rates to PPIs. Members were studied for a period of 1 year for claims with International Classification of Diseases-9th Revision diagnoses indicative of MI after starting clopidogrel therapy. We also examined comorbidities and severity of illness at the time of first clopidogrel use.

Our findings revealed 1-year acute MI rates of 1.38% (66 of 4,800 patients) in the control group, 3.08% (22 of 712 patients) in the low PPI exposure group, and 5.03% in the high PPI exposure group. Using the control group MI incidence as the expected MI rate, the difference in MI rates between the control and high exposure groups was significant ($p < 0.05$). Subsequent analysis identified small but significant comorbidity differences between the groups that could account for the findings. The high PPI exposure group had a slightly greater number of individuals with pre-