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RAPID COMMUNICATION

Role of the wearable cardioverter defibrillator in the initial period of sudden cardiac death risk stratification: results of a European Heart Rhythm Association survey

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Introduction

Although current evidence and European Society of Cardiology guidelines[1] do not recommend the routine use of wearable cardioverter defibrillators (WCDs), clinical indications are expanding, despite persistent gaps in the guidelines and implementation barriers.[2-10] Moreover, it remains uncertain whether the widespread use of contemporary heart failure (HF) therapies—specifically the 'big four' medications (angiotensin-converting enzyme inhibitors, beta-blockers, mineralocorticoid receptor antagonists, and SGLT2 inhibitors)—has reduced the need for implantable cardioverter defibrillator (ICD) implantation or, conversely, increased the demand for WCDs in clinical practice. This European Heart Rhythm Association (EHRA) survey aimed to assess current WCD use across European electrophysiology centres, evaluate emerging indications, and identify potential barriers to implementation. Additionally, the survey sought to determine whether contemporary HF therapies are influencing trends in ICDs and WCDs utilization.

Methods

This physician-based survey was promoted and disseminated by EHRA between 10 June and 25 July 2024. An online questionnaire, comprising both single- and multiple-choice questions, was developed, revised, and validated by the EHRA Scientific Initiative Committee. Results were collected anonymously in accordance with the European General Data Protection Regulation 2016/679. Data were analysed using descriptive statistics. Continuous variables are presented as mean ± standard deviation or median and interquartile range. Categorical variables are presented numerically with absolute percentages (%).

Results

A total of 182 respondents from 20 countries participated in the survey. The majority of respondents were aged between 40 and 49 years (31%; 50/158) and 74% (116/157) were male. The largest number of respondents were from Italy (37%; 58/156), Germany (23%; 36/156), and Spain (8%; 13/156). Most participants were affiliated with university hospitals (50%; 78/156), followed by non-university hospitals (39%; 61/156) and private hospitals (9%; 14/156). Regarding professional background, 23% (36/157) were general cardiologists, while 68% (107/157) had specific expertise in cardiac electrophysiology (*Figure 1*). A substantial proportion of respondents (92%; 118/128) reported performing ICD implantations as part of their routine clinical practice. The mean number of ICD implants performed per centre per year was 67.7 ± 33.2 (median 80; range 40–100).

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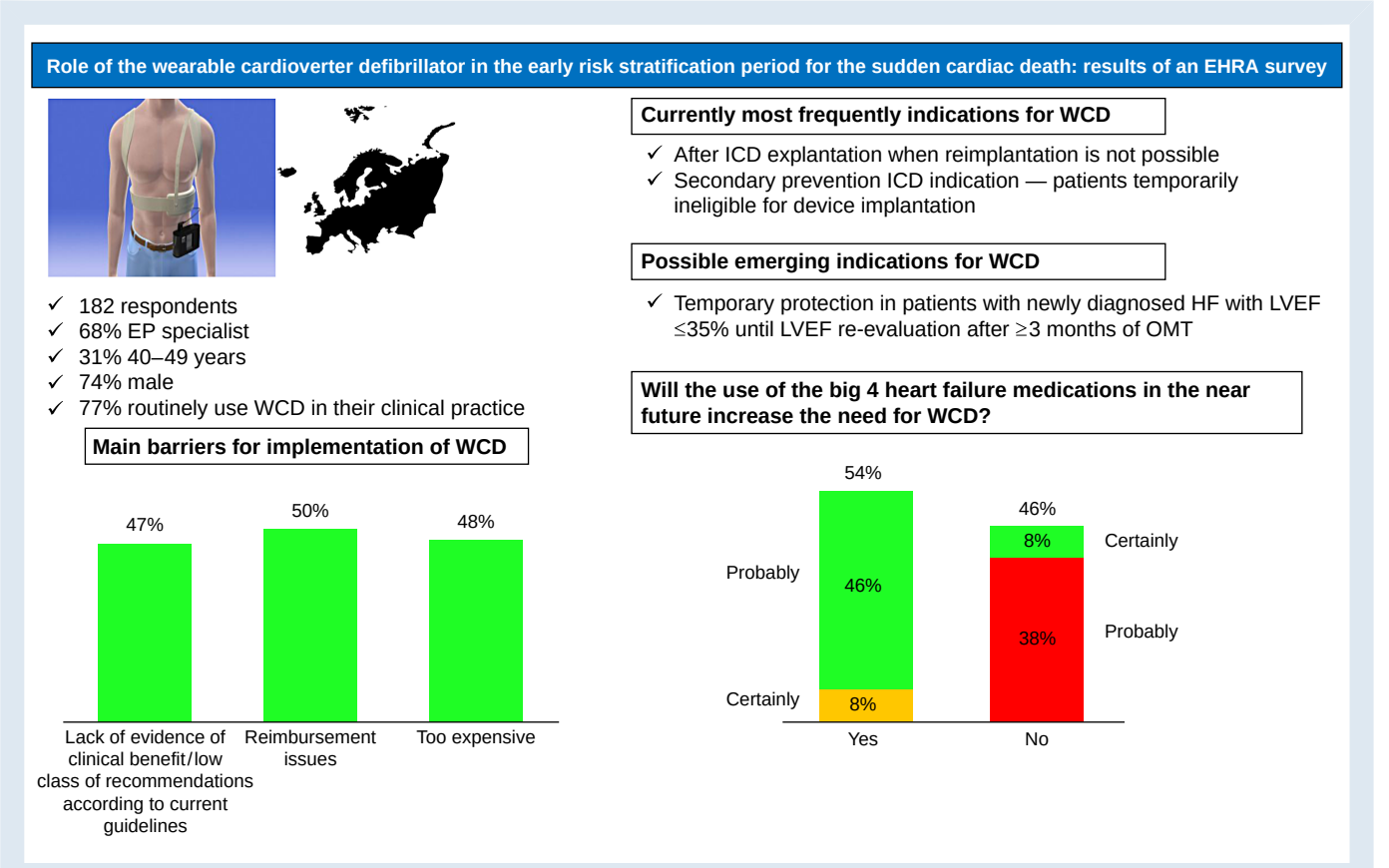

Figure 1 Main results of the EHRA survey including current most frequent indications, possible emerging indications for WCD ,and barriers for its implementation. EHRA, European Heart Rhythm Association; EP, electrophysiologists; HF, heart failure; ICD, implantable cardioverter defibrillator; LVEF, left ventricular ejection fraction; OMT, optimal medical therapy; WCD, wearable cardioverter defibrillator.

Routine use of the WCD in clinical practice was reported by 77% (98/126) of respondents. The median number of WCD prescribed during the past 12 months was 8.5 (1–17.75). Most respondents (64%; 80/116) reported that WCD implantation was predominantly reimbursed by national or public health funds in nearly all cases. In 15% (17/116), reimbursement required indication review and approval by an institutional committee. Coverage by the patients themselves and by private funds was reported by 3% each (4/116 respectively). The most frequently reported indication was recent ICD explantation when immediate reimplantation is not feasible (29% always, 13% often), followed by patients with a secondary prevention ICD indication who were temporarily ineligible for ICD implantation (22% always, 17% often; *Figure 1*). According to the majority of the respondents, the main emerging indication was secondary prevention in patients temporarily unsuitable for ICD implantation (53%), followed by temporary protection of newly diagnosed HF with left ventricular ejection fraction (LVEF) ≤ 35% until LVEF re-evaluation after ≥3 months of optimal medical therapy (OMT) (45%; *Figure 1*). Other emerging indications included post-ICD explantation when reimplantation was not possible (44%), early phase after myocardial infarction (40 days) with LVEF ≤ 35% (40%), and ischaemic cardiomyopathy with LVEF ≤ 35% following percutaneous or surgical revascularization until LVEF reassessment (39%).

From the physician's perspective, the main limitations and barriers to WCD implementation were reimbursement issues (50%; 56/111), costs (48%; 53/111), and the perceived lack of evidence supporting evidence or the low class of recommendation in current guidelines (47%; 52/111; *Figure 1*). Patient's barriers were moderately important (26%; 29/111). According to the physicians' perceptions, the primary patient-related concerns were low compliance (50%; 55/109), anxiety or fear of receiving a shock (41%; 45/109), incorrect use of WCD (36%; 39/109), and potential sleep disturbance (28%; 30/109).

Most respondents (55%; 63/114) reported proceeding with or referring patients for ICD implantation regardless of aetiology if LVEF remains ≤35% after 3 months of OMT, including the 'big four' medications recommended by current guidelines. A quarter (25%; 29/114) of respondents indicated they schedule further LVEF re-evaluation only in cases of non-ischaemic aetiology, while 19% (22/114) reported re-evaluating LVEF anyway, regardless of aetiology. The most common timing of LVEF re-evaluation adopted by respondents was 6 months (51%; 57/111). Approximately half of the respondents (54%; 61/114) believed that the use of the 'big four' HF medications is likely to reduce the need for ICD implantation while simultaneously increasing the demand for WCDs at their centre (*Figure 1*).

Discussion

The main findings of this survey are as follows:

(1) Despite heterogeneity in indications, limitations, and barriers, the clinical use of WCDs is increasing across EHRA member countries.
(2) The most frequent indications for WCD use are (i) post-ICD explantation when reimplantation is not feasible and (ii) patients with a

secondary prevention ICD indication who are temporarily not candidates for ICD implantation.

(3) A key emerging indication is the temporary protection of patients with *de novo* HF and an LVEF ≤ 35%, during the initial period of OMT, until LVEF can be re-evaluated after at least 3 months. This strategy may reduce the need for early ICDs implantation while increasing the demand for WCDs.

(4) From the physician's perspective, the main barriers to WCD implementation are reimbursement issues, high costs, and the lack of evidence supporting clinical benefit, compounded by the low class of recommendation in current guidelines.

(5) According to the physicians' perception, patients' major concerns are low compliance and anxiety or fear of receiving a shock;

(6) Approximately half of respondents believe that the use of the 'big four' HF medications is likely to reduce the need for ICD implantation, while simultaneously increasing the demand for WCDs in their institutions.

This survey has several limitations. The relatively low number of respondents and the disproportionately high representation from Italy and Germany limit the generalizability of the findings to other categories of European practitioners and across all European countries. Furthermore, the observed heterogeneity in indications for WCD use across centres, along with a tendency to exclude certain vulnerable patient groups, highlights the current gaps in knowledge regarding the use of WCD in specific subpopulations. The observed variability in indications among respondents highlights the current lack of robust evidence regarding the role of WCDs in specific subpopulations, emphasizing the need for further dedicated studies.

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Data availability

The data underlying this article will be shared on reasonable request to the corresponding author.

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