Original Investigation

Sudden Cardiac Death After Non–ST-Segment Elevation Acute Coronary Syndrome

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IMPORTANCE In the current therapeutic era, the risk for sudden cardiac death (SCD) after non–ST-segment elevation acute coronary syndrome (NSTE ACS) has not been characterized completely.

OBJECTIVE To determine the cumulative incidence of SCD during long-term follow-up after NSTE ACS, to develop a risk model and risk score for SCD after NSTE ACS, and to assess the association between recurrent events after the initial ACS presentation and the risk for SCD.

DESIGN, SETTING, AND PARTICIPANTS This pooled cohort analysis merged individual data from 48 286 participants in 4 trials: the Apixaban for Prevention of Acute Ischemic Events 2 (APPRAISE-2), Study of Platelet Inhibition and Patient Outcomes (PLATO), Thrombin Receptor Antagonist for Clinical Event Reduction in Acute Coronary Syndrome (TRACER), and Targeted Platelet Inhibition to Clarify the Optimal Strategy to Medically Manage Acute Coronary Syndromes (TRILOGY ACS) trials. The cumulative incidence of SCD and cardiovascular death was examined according to time after NSTE ACS. Using competing risk and Cox proportional hazards models, clinical factors at baseline and after the index event that were associated with SCD after NSTE ACS were identified. Baseline factors were used to develop a risk model. Data were analyzed from January 2, 2014, to December 11, 2015.

MAIN OUTCOMES AND MEASURES Sudden cardiac death.

RESULTS Of the initial 48 286 patients, 37 555 patients were enrolled after NSTE ACS (67.4% men; 32.6% women; median [interquartile range] age, 65 [57-72] years). Among these, 2109 deaths occurred after a median follow-up of 12.1 months. Of 1640 cardiovascular deaths, 513 (31.3%) were SCD. At 6, 18, and 30 months, the cumulative incidence estimates of SCD were 0.79%, 1.65%, and 2.37%, respectively. Reduced left ventricular ejection fraction, older age, diabetes mellitus, lower estimated glomerular filtration rate, higher heart rate, prior myocardial infarction, peripheral artery disease, Asian race, male sex, and high Killip class were significantly associated with SCD. A model developed to calculate the risk for SCD in trials with systematic collection of left ventricular ejection fraction had a C index of 0.77. An integer-based score was developed from this model and yielded a calculated SCD probability ranging from 0.1% to 56.7% (C statistic, 0.75). In a multivariable model that included time-dependent clinical events occurring after the index hospitalization for ACS, SCD was associated with recurrent myocardial infarction (hazard ratio [HR], 2.95; 95% CI, 2.29-3.80; *P* < .001) and any hospitalization (HR, 2.45; 95% CI, 1.98-3.03; *P* < .001), whereas coronary revascularization had a negative relationship with SCD (HR, 0.75; 95% CI, 0.58-0.98; *P* = .03).

CONCLUSIONS AND RELEVANCE In the current therapeutic era, SCD accounts for about one-third of cardiovascular deaths after NSTE ACS. Risk stratification can be performed with good accuracy using commonly collected clinical variables. Clinical events occurring after the index hospitalization are underappreciated but important risk factors.

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Sudden cardiac death (SCD) is a catastrophic sequela of acute myocardial infarction (MI).[1] Improvements in primary and secondary cardiac prevention therapy have led to reductions in coronary heart disease–related deaths during the past 50 years, but corresponding declines in SCD have not been observed.[2,3] The temporal change in the incidence of SCD after MI has been reported from large clinical trials, tertiary care centers, and a community setting. However, prior studies took place in the thrombolytic era[4,5] or were limited to one[6,7] or two[8] locations or trials.[9] An understanding of SCD in the setting of contemporary practice, with more accurate diagnosis of MI via measurement of cardiac troponin levels and more widespread use of revascularization and dual antiplatelet therapy, is needed.

Improving management strategies to prevent SCD after an acute coronary syndrome (ACS) requires an understanding of a patient's individual absolute risk. However, algorithms to assess individual patients' risks for SCD in the post-ACS setting have not been developed. In addition, the baseline risk for SCD based on characteristics at presentation may change over time, as in the case of recurrent clinical events. Finally, the effect of events occurring after the index ACS, such as recurrent MI, on the long-term risk for SCD is unclear.

We set out to address the aforementioned gaps in knowledge using pooled patient-level data from 4 contemporary, controlled, multinational randomized clinical trials among patients presenting with an ACS. Specifically, the current analysis sought to determine the cumulative incidence of SCD during long-term follow-up after non–ST-segment elevation (NSTE) ACS, to develop a risk-calculation model and risk score for SCD after NSTE ACS, and to assess the association between ischemic events occurring after the initial ACS presentation and the risk for SCD.

Methods

Data Sources and Study Population

Individual patient data from the following contemporary clinical trials were pooled: Study of Platelet Inhibition and Patient Outcomes (PLATO; 18 624 participants),[10,11] Apixaban for Prevention of Acute Ischemic Events 2 (APPRAISE-2; 7392 participants),[12,13] Thrombin Receptor Antagonist for Clinical Event Reduction in Acute Coronary Syndrome (TRACER; 12 944 participants),[14,15] and Targeted Platelet Inhibition to Clarify the Optimal Strategy to Medically Manage Acute Coronary Syndromes (TRILOGY ACS; 9326 participants).[16,17] The designs[12,18-20] and primary results[10,12,14,16] of these trials have been published previously. They recruited patients with moderate- to high-risk ACS (high-risk unstable angina and acute MI) and were multicenter, randomized, and placebo controlled. Trial dates were October 11, 2006, to July 18, 2008, for PLATO; March 17, 2009, to November 18, 2010, for APPRAISE-2; December 18, 2007, to November 30, 2010, for TRACER; and June 27, 2008, to September 12, 2011, for TRILOGY ACS. Data for this report were previously collected during the conduct of the primary trials, which were all approved by the appropriate national and institutional regulatory authorities and ethics committees, and

Key Points

Question What is the incidence of and risk for sudden cardiac death (SCD) after non–ST-segment elevation acute coronary syndrome (ACS)?

Findings In pooled data from 4 ACS trials, SCD occurred at a rate of approximately 1% per year yet accounted for 31.3% of cardiovascular deaths. Risk for SCD was assessed using left ventricular ejection fraction, age, diabetes mellitus, estimated glomerular filtration rate, heart rate, myocardial infarction, peripheral artery disease, race, sex, and Killip class and was modified by events after the index presentation.

Meaning A user-friendly risk score can identify patients at risk for SCD after ACS.

all of the trials' participants provided written informed consent. The institutional review board of Duke University approved the use of the deidentified data set for this analysis.

PLATO and APPRAISE-2 included patients with ST-segment elevation MI or NSTE ACS, whereas TRACER and TRILOGY ACS included patients with NSTE ACS only. For the present analysis, the study cohort consisted of patients with an NSTE ACS index event. Race or ethnicity was self-identified among several options defined according to the trial and included in the analysis in view of its potential role in SCD. Because the aim of this analysis was to evaluate SCD, patients receiving an implantable cardioverter defibrillator (ICD) after randomization were excluded because SCD would have been prevented in these patients, and ICD-prevented deaths were not collected systematically. A total of 333 patients who had an ICD implanted at study entry or during follow-up were excluded (PLATO, 111 participants; APPRAISE-2, 26 participants; TRACER, 136 participants; and TRILOGY ACS, 60 participants). A method to measure left ventricular ejection fraction (LVEF) was not mandated, although echocardiography was preferred when available.

Outcomes

The main outcome of interest for this analysis was SCD. In each of the 4 trials included, components of the primary end point were adjudicated by their respective independent clinical event committees using standardized definitions. The clinical event committees also adjudicated cause and type of death, including a determination of whether the death was sudden and cardiac related. We defined SCD as a sudden, unexpected death that was cardiac in origin. Sudden cardiac death was witnessed and occurred without new or worsening symptoms or occurred within 60 minutes from the onset of new symptoms in the absence of a clear noncardiovascular cause. Alternatively, SCD was unwitnessed and occurred within 24 hours of the patient being observed alive in the absence of preexisting, progressive circulatory failure. Sudden death included deaths that occurred after successful initial resuscitation without subsequent recovery. Such deaths were a direct consequence of the cardiac arrest. Classification of witnessed and unwitnessed SCD performed by the clinical event committee was available in 3 of the 4 trials (not TRILOGY ACS); in the

3 trials for which this information was included in the database, 180 of 289 SCDs (62.3%) were witnessed. Cardiac arrest not followed by death (n = 66) was not counted as SCD.

Statistical Analysis

The analyses included herein were conducted from January 2, 2014, to December 11, 2015. Baseline characteristics of patients were compared among trials. Categorical and continuous variables were displayed as frequencies and as medians with 25th and 75th percentiles, respectively. Sudden cardiac death, cardiovascular death, and all-cause death rates were summarized with cumulative incidence curves. Time 0 was defined as the day of randomization.

To identify factors associated with the risk for SCD, a stratified competing risk model[21] was fitted. A Fine and Gray model[22] accounts for competing risks of the outcome of interest and can be interpreted in a manner similar to Cox proportional hazards models. In this instance, the model accounted for the competing risk for non-SCD. Candidate covariates were age, sex, race, region of origin, diabetes mellitus, prior MI, history of peripheral artery disease, body mass index, history of atrial fibrillation, dyslipidemia, systolic and diastolic blood pressure, heart rate, smoking status, chronic obstructive pulmonary disease, ST-segment changes, Killip class, estimated glomerular filtration rate derived from the modified Cockcroft-Gault equation that adjusts for body surface area,[23] and positive findings for cardiac biomarkers (creatine kinase MB [myocardial band] fraction and troponin).

The analysis was stratified by trial arm. The final model was selected from the set of candidate variables using stepwise selection. Linearity of continuous variables and the proportional hazards assumption were examined; splines were used as appropriate, and no substantial deviation from the proportional hazards assumption was noted for all variables.

The final model was selected using a stepwise selection strategy. A first model was developed using the 4-trial cohort (37 615 patients with NSTE ACS). Because LVEF and heart failure status are known to be important risk factors for SCD, we developed a new and complete model from the trials in which LVEF was systematically collected (TRACER and TRILOGY ACS; 22 270 patients). The final model inclusive of LVEF was converted into a user-friendly integer score to calculate the probability of SCD at 2 years. Continuous variables were grouped into convenient categories (eg, 10 years for age). Because SCD is a relatively infrequent event, we decided to use the entire database for development, without reserving a cohort for validation, to maximize the number of events in the development of the model. Prognostic ability of the final model and the derived score were quantified with the C statistic and the optimism-corrected C statistic.[24] Calibration of the score was assessed by comparing the expected and observed cumulative incidence at 2 years.

To assess the association between ischemic events occurring after the index ACS presentation and the risk for SCD, the following time-dependent covariates were added individually to the final adjusted model derived using the 4 trials: MI, stroke, percutaneous coronary intervention and/or coronary artery bypass grafting, and rehospitalization for any reason.

We specifically assessed the first of any particular events occurring after hospitalization. For each of those variables, a separate model adjusted for baseline variables was developed. To understand whether the baseline and time-dependent covariates were related to SCD or a competing risk, proportional hazards modeling was also performed. All P values correspond to 2-sided hypothesis tests with α = .05. All statistical analyses were performed with SAS software (version 9.4; SAS Institute Inc).

Results

Baseline Patient Characteristics

Of the initial 48 286 patients, the final study sample consisted of 37 555 patients who were enrolled after NSTE ACS (4449 from APPRAISE-2; 11 032 from PLATO; 12 808 from TRACER; and 9266 from TRILOGY ACS). In the pooled cohort, 83.3% had positive findings for cardiac biomarkers (troponin or creatine kinase MB fraction) at presentation. eTable 1 in the Supplement shows the patients' baseline characteristics. In the overall study cohort, the median age was 65 (interquartile range, 57-72) years; 67.4% were men and 32.6% were women. Patients were predominantly white (85.5%) and European (53.8%). On presentation, blood pressure and heart rate were usually within reference ranges, and the Killip class was typically I to II (98.6%). Most patients had dyslipidemia (58.1%), whereas fewer had diabetes mellitus (34.1%), a history of MI (33.0%), or peripheral artery disease (8.6%). In the 2 trials in which LVEF was available, 40.6% of patients had some degree of systolic dysfunction.
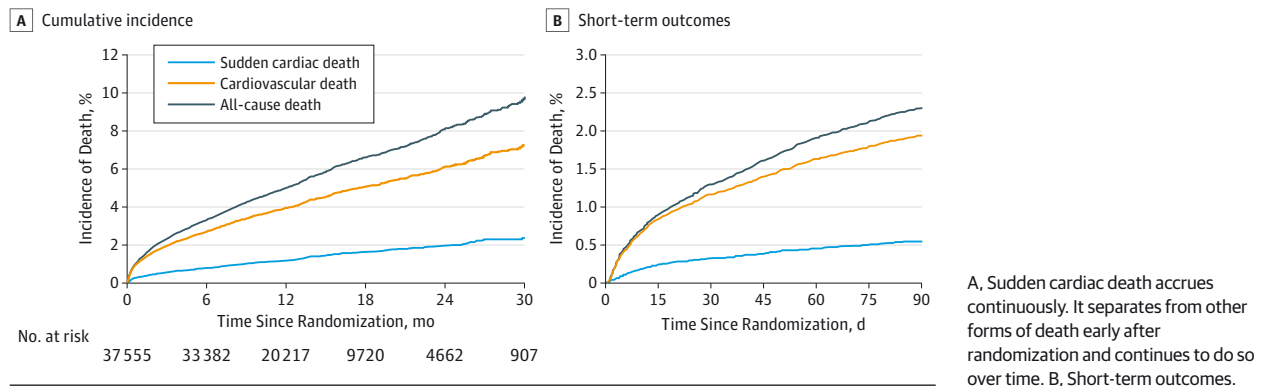
Incidence of SCD

After a median follow-up of 12.1 (interquartile range, 9.0-18.4) months, a total of 2109 deaths occurred. Of 1640 cardiovascular deaths, 513 (31.3%) were SCDs. The rate of SCD was 1.18 per 100 patient-years of follow-up. The **Figure** shows the cumulative incidence of sudden, cardiovascular, and all-cause deaths as a function of time after NSTE ACS. At 6, 18, and 30 months, the cumulative incidences of SCD were 0.79%, 1.65%, and 2.37%, respectively. The SCD outcome accrues continuously over time. It separates from other forms of death early after the index event and continues to do so for the duration of the study period.

Baseline Factors Associated With SCD

Variables significantly associated with SCD on univariate analysis are reported in eTable 2 in the Supplement. The multivariable model developed using the 4-trial cohort includes a low creatinine clearance rate, faster heart rate, older age, male sex, diabetes mellitus, prior MI, Asian race, and history of peripheral artery disease, and it had a C statistic of 0.73 (optimism-corrected C statistic, 0.72; eTable 3 in the Supplement). The final multivariable model developed from the 2 trials, including LVEF, is reported in **Table 1**. The complete model, including LVEF, had a C statistic of 0.77 (optimism-corrected C statistic, 0.76). All the variables that were included in the model developed from the initial 4-trial population retained statistical

Figure. Cumulative Incidence of All-Cause, Cardiovascular, and Sudden Cardiac Deaths

A, Sudden cardiac death accrues continuously. It separates from other forms of death early after randomization and continues to do so over time. B, Short-term outcomes.

significance except for systolic blood pressure, with the additional strong association seen with LVEF (P < .001).

Integer-Based SCD Risk Calculator

The final multivariable model including baseline characteristics was converted into a user-friendly, integer-based risk score that could be used to estimate the risk for SCD in individual patients with NSTE ACS with relative simplicity. This simplified, integer-based model did not have a significant loss in accuracy compared with the full model (C statistic, 0.75). **Table 2** shows points assigned to each variable in the model. **Table 3** shows the calculated probability of SCD at 2 years, accounting for all risk factors. Based on a calculated integer score from 0 to 50, the estimated risk for SCD at 2 years ranged from 0.1% to 56.7%. A total of 51.0% of patients had risks of less than 1% (score, 0-15); 40.0% of patients had risks ranging from 1.7% to 3.3% (score, 20-25); and 9.0% of patients had a risk for SCD at 2 years of 6.1% or higher (score, ≥30).

Recurrent Clinical Events and Risk for Subsequent SCD

We assessed the relationship between time-dependent, recurrent clinical events after the initial hospitalization for NSTE ACS and the risk for SCD. Patients who had recurrent MI (hazard ratio [HR], 2.95; 95% CI, 2.29-3.80; χ^2 = 70.1; P < .001) and those who had a rehospitalization for any reason (HR, 2.45; 95% CI, 1.98-3.03; χ^2 = 68.7; P < .001) had an increase in the risk for SCD. Revascularization with percutaneous intervention or coronary bypass grafting demonstrated a statistically significant but weaker association with reduced SCD risk (HR, 0.75; 95% CI, 0.58-0.98; χ^2 = 4.6; P = .03); the association of percutaneous coronary intervention alone (HR, 0.77; 95% CI, 0.60-1.00; χ^2 = 3.8; P = .05) or coronary artery bypass grafting alone (HR, 1.02; 95% CI, 068-1.55; χ^2 < 0.1; P = .91) was not significant. In multivariable Cox proportional hazards models, results were consistent.

Discussion

We report 3 main findings of this analysis. First, in the current NSTE ACS therapeutic era, SCD occurs relatively infrequently at a rate of approximately 1% per year, yet it accounts

for one-third of cardiovascular deaths observed during follow-up. Sudden cardiac death accrues continuously over time; its incidence does not plateau even after the first year from the acute event. Second, an SCD risk model consisting of commonly collected clinical variables, from which we derived a more user-friendly risk score, can be used for risk stratification of SCD and identification of patients who are at higher risk for SCD. Third, recurrent events subsequent to the initial ACS presentation, in particular recurrent MI and rehospitalization, are associated with the risk for subsequent SCD.

Several prior studies have identified factors associated with SCD after MI. In an observational analysis of Olmsted County in Minnesota, age, male sex, hypertension, comorbidity burden, and heart failure class were associated with an elevated risk.[7] In a secondary analysis of the Valsartan in Acute Myocardial Infarction Trial (VALIANT)[25]—a multinational clinical trial—increasing weight, lower creatinine clearance, and country of enrollment were also identified as risk factors. The results of the present study of baseline risk factors are consistent with those of prior analyses.[7,25,26] We also observed an increased risk for SCD after NSTE ACS among Asian patients relative to those of other races. Because Asians were underrepresented in prior studies, this finding merits further investigation.

With certain clinical risk factors associated with SCD, the development of a comprehensive risk-stratification tool that accounts for SCD-associated clinical characteristics and produces a user-friendly risk score may be helpful in NSTE ACS clinical care and research. First, this tool may be used to support treatment and counseling of individual patients. Second, it may help select patients in whom devices aimed at preventing SCD, such as ICDs or wearable defibrillators, could be further studied.

The ICD is the mainstay of SCD prophylaxis. Not all patients at high risk for SCD gain a survival benefit from an ICD, including those with a recent MI[27,28] or recent revascularization.[29] Because SCD represents a relatively common type of death after NSTE ACS, identifying subsets of patients with NSTE ACS at high risk for SCD may lead to the development of targeted primary prevention strategies. A user-friendly risk score may be used for clinical studies assessing those interventions. Prospective assessment of device therapy is warranted because not all

Table 1. Complete Model Used to Calculate the Probability of SCD[a]

Factor	χ^2 Statistic	HR (95% CI)
LVEF, %		
≥55		1 [Reference]
45-54	26.5	1.77 (1.31-2.39)
35-44		1.91 (1.35-2.70)
<35		2.46 (1.68-3.61)
Age per 5-y increase	21.0	1.17 (1.10-1.26)
Diabetes mellitus	16.7	1.67 (1.30-2.13)
eGFR per 5-mL/min/1.73 m² decrease[b]	14.9	1.09 (1.05-1.15)
Heart rate per 5-bpm increase	14.3	1.08 (1.04-1.13)
History of peripheral artery disease	10.4	1.70 (1.23-2.34)
Race		
White		1 [Reference]
Asian	12.5	1.75 (1.28-2.39)
Other		1.10 (0.54-2.24)
Male sex	6.7	1.42 (1.09-1.85)
Killip class >1	5.4	1.44 (1.06-1.95)
Prior MI	4.9	1.33 (1.03-1.70)

Abbreviations: eGFR, estimated glomerular filtration rate; HR, hazard ratio; LVEF, left ventricular ejection fraction; MI, myocardial infarction; SCD, sudden cardiac death.

[a] The C statistic was 0.77 (optimism-corrected C statistic, 0.76). The model was developed from the Thrombin Receptor Antagonist for Clinical Event Reduction in Acute Coronary Syndrome (TRACER) and Targeted Platelet Inhibition to Clarify the Optimal Strategy to Medically Manage Acute Coronary Syndromes (TRILOGY ACS) trials, which collected all variables of interest.

[b] Hazard ratio applicable to eGFR less than 70 mL/min/1.73m²

Table 2. Integer-Based Score to Calculate the Risk for SCD After NSTE ACS

Risk Factor	Points
Age, y	
40-49	0
50-59	2
60-69	5
70-79	7
≥80	10
Male sex	3
Race	
Nonwhite or non-Asian	0
White	4
Asian	7
Heart rate, bpm	
<60	0
60-69	1
70-79	3
≥80	4
Diabetes mellitus	4
No	0
Yes	4
Prior MI	
No	0
Yes	2
Peripheral artery disease	
No	0
Yes	4
eGFR, mL/min/1.73 m²	
≥70.0	0
60.0-69.9	1
50.0-59.9	3
40.0-49.9	4
<40.0	6
LVEF, %	
≥55	0
45-54	2
35-44	5
<35	7
Killip class	
I	0
≥II	3

Abbreviations: eGFR, estimated glomerular filtration rate; LVEF, left ventricular ejection fraction; MI, myocardial infarction; NSTE ACS, non–ST-segment elevation acute coronary syndrome; SCD, sudden cardiac death.

sudden death is arrhythmic and may in fact stem from other causes such as recurrent MI or cardiac rupture.

A key finding of this analysis is that the risk for SCD is not static over time from NSTE ACS but is significantly influenced by events that occur after the initial hospitalization. Coronary artery disease is dynamic in nature, and markers of risk shift with varying expression of the disease. In particular, a recurrent MI was associated with a 3.0-fold increase in the risk for SCD, whereas rehospitalization for any reason was associated with a 2.4-fold increase in the risk for SCD. Coronary revascularization procedures were associated with a decreased risk for SCD. Similar findings were observed in the VALIANT trial,[25] which only included patients with MI presenting with heart failure or a reduced (<40%) LVEF. Our results, in addition to confirming the importance of recurrent ischemic events, expand their significance to a general population with NSTE ACS.

In the Olmsted County database,[7] the association with recurrent ischemic events was weaker. A comparative strength of the present analysis is the use of trial data with systematically identified end points. The present analysis deepens understanding of the studied variables by examining their association with the risk for SCD and accounting for competing risks for non-SCD; to our knowledge, our study is the first to do so. Prevention of events downstream from the index hospitalization may be as important as considering ICDs for these patients. More data regarding the additive prognostic significance of clinical events after hospitalization and their implications for treatment are needed.

Limitations of this analysis should be acknowledged. First, this analysis uses databases from clinical trials, and only the variables available from each trial database were used. In addition, because patients in clinical trials are known to be more selected than real-world patients with ACS, issues with generalizability of clinical trial findings apply. Our analysis was observational in nature, and thus unmeasured or residual confounding may exist. The LVEF was not available in 2 of the 4

Table 3. Calculated Probability of SCD at 2 Years According to the Risk Score[a]

Total Points on Nomogram	Distribution of Patients, %	Observed Cumulative Incidence at 2 Years, % (No. of Events)	Patients With LVEF>35%, %
0			
5	17.6	0.49 (9)	99.9
10			
15	33.4	0.53 (25)	99.4
20	26.2	2.29 (72)	95.7
25	13.8	3.84 (65)	88.5
30	6.1	6.26 (51)	75.3
35	2.3	12.04 (35)	59.2
40			
45	0.6	19.24 (14)	44.7
50			

Abbreviations: LVEF, left ventricular ejection fraction; SCD, sudden cardiac death.

[a] The C statistic was 0.75 (optimism-corrected C statistic, 0.75).

trials studied; therefore, the final model was developed using only the 2 trials with consistent collection of LVEF. Nonetheless, the models from the 4 trials and the models including LVEF and Killip class were consistent, with the additional precision gained by adding the LVEF.

Trials included in the analysis assessed experimental therapies, and not all of them are currently considered standard of care. Additional differences were found in the control arms of the trials, although they all aimed to assess the standard of care and generally used dual antiplatelet therapy as background treatment. To address this issue, we considered arms within each trial as strata in the analysis. The adjudication of SCD was based on clinical information depicting the scenario of death and relied on information provided by investigative sites.

Despite clear definitions, the cardiac or electrical origin of SCD cannot be confirmed in all instances and in some cases is assumed, particularly when death is unwitnessed. The models developed were based on simple baseline clinical information, standard laboratory evaluation, and imaging. Although we were able to discriminate high-risk groups of patients, a significant number of events were still observed in the numerically larger, low-risk portion of the population. More detailed investigation, such as an electrophysiology study, ambulatory electrocardiographic monitoring, or electrocardiographic analysis, may be required on certain patients to further characterize the risk for SCD.

Although the C index in our model has a good prognostic value, it also shows that other information is needed for further improvement of risk stratification. Because SCD is a relatively infrequent event, we used the entire population to develop the model so that no validation cohort was spared. However, we performed internal validation with bootstrapping that confirmed C statistics calculated in the model. Further external validation would be helpful.

In view of the difficulty finding a comparable data set, a prospectively designed future study may be required. We show that recurrent clinical events are associated with the risk for SCD, but those could not be included in the clinical risk model. The outcome of this analysis was sudden death, and we did not account for cardiac arrests not leading to death or ICD-prevented deaths because this information was not collected. Although the risk score presented was developed from a large data set, further validation may be helpful.

Conclusions

Sudden cardiac death accounts for one-third of cardiovascular deaths observed after discharge from a hospitalization for NSTE ACS. The risk for SCD significantly varies among patients with NSTE ACS, and a risk-stratification tool can be used to identify patients with NSTE ACS at high risk. In addition, patients with recurrent MI or rehospitalization after the initial NSTE ACS have a significantly increased risk for SCD. Future research is needed to assess the implementation of drug- or device-based strategies that may reduce the risk for SCD in high-risk patients after NSTE ACS.

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