ORIGINAL RESEARCH

Interrelationships Between American Heart Association's Life's Simple 7, ECG Silent Myocardial Infarction, and Cardiovascular Mortality

Muhammad Imtiaz Ahmad, MD;* Parag Anilkumar Chevli, MD;* Harsh Barot, MD, MPH; Elsayed Z. Soliman, MD, MSc, MS

Background—We examined the interrelationships among cardiovascular health (CVH), assessed by the American Heart Association's Life's Simple 7 (LS7) health metrics, silent myocardial infarction (SMI), and cardiovascular disease (CVD) mortality.

Methods and Results—This analysis included 6766 participants without a history of coronary heart disease from the Third Report of the National Health and Nutrition Examination Survey. Poor, intermediate, and ideal CVH were defined as an LS7 score of 0 to 4, 5 to 9, and 10 to 14, respectively. SMI was defined as ECG evidence of myocardial infarction without a clinical diagnosis of myocardial infarction. Cox proportional hazard analysis was used to examine the association of baseline CVH with CVD death stratified by SMI status on follow-up. In multivariable logistic regression models, ideal CVH was associated with 69% lower odds of SMI compared with poor CVH. During a median follow-up of 14 years, 907 CVD deaths occurred. In patients without SMI, intermediate CVH (hazard ratio, 1.41; 95% CI, 1.14–1.74) and poor CVH (hazard ratio, 2.77; 95% CI, 2.10–3.66) were associated with increased risk of CVD mortality, compared with ideal CVH. However, in the presence of SMI, the magnitude of these associations almost doubled (hazard ratio, 2.17 [95% CI, 1.42–3.32] for intermediate CVH and hazard ratio, 6.28 [95% CI, 3.02–13.07] for poor CVH). SMI predicted a significant increased risk of CVD mortality in the intermediate and poor CVH subgroups but a nonsignificant increased risk in the ideal CVH subgroup.

Conclusions—Ideal CVH is associated with a lower risk of SMI, and concomitant presence of SMI and poor CVH is associated with a worse prognosis. These novel findings underscore the potential role of maintaining ideal CVH in preventing future CVD outcomes. **(*J Am Heart Assoc*. 2019;8:e011648. DOI: 10.1161/JAHA.118.011648.)**

Key Words: cardiovascular disease prevention • cardiovascular outcomes • lifestyle

Ideal cardiovascular health (CVH) based on the American Heart Association's (AHA's) Life's Simple 7 (LS7) metrics has been consistently associated with lower risk of coronary heart disease, stroke, atrial fibrillation, and congestive heart failure in population studies.[1–3] Although the association between LS7 health metrics and clinically recognized myocardial infarction (MI) is well established, no studies have explored the relationship between silent MI (SMI) detected on screening ECG and CVH.

Previous studies have shown that SMI represents over half of the total number of infarctions and is associated with increased risk of poor cardiovascular outcomes including coronary heart disease, stroke, congestive heart failure, atrial fibrillation, and mortality.[4–6] Prognosis of SMI is similar or worse than clinically recognized MI.[4] Since both SMI and poor CVH are markers of poor outcomes, we hypothesized that their concomitant presence would be associated with worse prognosis. Also, given the reports of the benefits of ideal CVH, we hypothesized that SMI is less harmful in the presence of ideal CVH. If true, those 2 hypotheses would not only help identify those at high risk but would also provide further support for the benefit of ideal CVH.

Therefore, in this analysis from NHANES III (Third Report of the National Health Nutrition and Examination Survey), we examined the association of CVH, assessed by AHA's LS7 health metrics, with SMI. Then, we examined how the

From the Sections on Hospital Medicine (M.I.A., P.A.C., H.B.) and Cardiology (E.Z.S.), Department of Internal Medicine, and Epidemiological Cardiology Research Center (EPICARE), Department of Epidemiology and Prevention (E.Z.S.), Wake Forest School of Medicine, Winston-Salem, NC.

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*Dr Ahmad and Dr Chevli contributed equally to this work.

Correspondence to: Muhammad Imtiaz Ahmad, MD, Wake Forest School of Medicine, Medical Center Boulevard, Winston Salem, NC 27157. Email: muahmad@wakehealth.edu

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Clinical Perspective

What Is New?

- Ideal cardiovascular health assessed by the American Heart Association's Life's Simple 7 health metrics is associated with lower prevalence of silent myocardial infarction.
- Concomitant presence of poor cardiovascular health and silent myocardial infarction predicted highest risk of cardiovascular disease mortality, while ideal cardiovascular health did not predict cardiovascular disease mortality even in the presence of silent myocardial infarction.

What Are the Clinical Implications?

- These findings underscore the potential importance of maintaining ideal cardiovascular health in reducing the risk of silent myocardial infarction and its associated poor outcomes.

concomitant presence of CVH and SMI modifies the associations of each with CVD mortality.

Methods

Study Participants

The data that support the findings of this study are available from the corresponding author upon reasonable request. NHANES is a periodic survey of the noninstitutionalized civilian population in the United States. Its principal aim is to determine estimates of disease prevalence and health status of children and adults. The structure of NHANES III (1988 and 1994), its components, and resulting data are published elsewhere.[7] The NHANES III study was approved by the research ethics review board of the National Center for Health Statistics, and documented consent was obtained from participants.

For this analysis, we considered only NHANES III participants who underwent an ECG recording (n=8561). We excluded participants with prior coronary heart disease, pacemakers, major intraventricular conduction delay including complete left bundle branch block and complete right bundle branch block, with QRS duration ≥120 ms, and missing key covariates. After exclusions (n=1795), 6766 participants were available for final analysis.

Definition of LS7 CVH Metrics

Based on the data available in NHANES III, the AHA's LS7 components were defined as follows.[8] For total cholesterol (TC), ideal health was defined as TC <200 mg/dL without any drug treatment; intermediate health was defined as untreated TC 200 to 239 mg/dL or treated TC level <200 mg/dL; and poor health was defined as TC >240 mg/dL. For blood pressure (BP), ideal health was defined as untreated BP <120/80 mm Hg; intermediate health was defined as systolic BP 120 to 139 or diastolic BP 80 to 89 mm Hg or <120/80 mm Hg on antihypertensive medications; and poor health was defined as BP >140/90 mm Hg. For diabetic health, ideal health was defined as glycated hemoglobin <5.7%, not on antidiabetic medications; intermediate health was defined as glycated hemoglobin 5.7% to 6.4% or <5.7% on antidiabetic medications; and poor health was defined as glycated hemoglobin ≥6.5%. Body mass index (BMI) was calculated from height and weight measurements. For BMI, ideal health was defined as BMI <25 kg/m^2; intermediate health was defined as BMI 25 to 29.9 kg/m^2, and poor health was defined as BMI ≥30 kg/m^2. For smoking, ideal health was defined as never smoker; intermediate health was defined as former smoker, and poor health was defined as current smoker. We used the healthy eating index (HEI) created by the US Department of Agriculture.[9] The index was calculated from dietary information collected by the single 24-hour recall. The HEI includes 3 of the 5 primary criteria included in the AHA's healthy dietary score: intake of fruits and vegetables, whole grains, and sodium. Ideal health was defined as an HEI >80; intermediate health was defined as an HEI 50 to 80; and poor health was defined as an HEI <50.[8] For physical activity, we used metabolic equivalent calculated in NHANES.[10] We defined ideal health as engaging in any physical activity with 3 to 5.99 metabolic equivalents and ≥5 times per week or any physical activity with ≥6 metabolic equivalents and ≥3 times per week[11]; intermediate health as any activity other than the above; and poor health defined as no activity at all.

Each LS7 component was given a point score of 0, 1, or 2 to represent poor, intermediate, or ideal health, respectively. An overall LS7 score ranging from 0 to 14 was calculated as the sum of the LS7 component scores. This score was classified as poor (0–4), intermediate (5–9), or ideal (10–14) CVH.

Electrocardiogram

Resting 12-lead ECGs were obtained with a Marquette MAC 12 system (Marquette Medical Systems) during the mobile examination visits by trained technicians. Analysis of ECGs was achieved through a computerized automated process and visual inspection by a trained technician located in a centralized core laboratory. Participants were considered to have SMI if they reported no history of MI but had evidence of MI on ECG. ECG diagnosis of prior MI was defined using the Minnesota code as the presence of a major Q-wave abnormality (Minnesota code 1-1-X or 1-2-X) or minor Q/QS

waves with major ST-T abnormalities (Minnesota code 1-3-X with 4-1-X, or 4-2, or 5-1, or 5-2).[12]

Mortality Assessment

The NHANES III participants were followed up for mortality through December 31, 2006. CVD mortality served as an outcome for this study. The probabilistic matching method was used to link NHANES III participants with the National Death Index for vital status and the cause of death in deceased patients. Name, social security number, and date of birth were parts of 12 identifiers used to match the participants. The follow-up duration was defined as the period between initial examination for NHANES III participation and December 31, 2006, or date of death, whichever occurred first.

Covariates

Age, sex, race/ethnicity, income, prior CVD, and alcohol intake were self-reported. Among current drinkers, alcohol use was classified by the number of drinks per week reported by study participants using the following criteria: moderate (1–2 drinks per day for men and 1 drink per day for women), and heavy (>2 drinks per day for men and >1 drink per day for women). Blood samples were collected via venipuncture by a phlebotomist. Samples were analyzed for TC, high-density lipoprotein cholesterol, glucose, and C-reactive protein using laboratory procedures as reported by the National Center for Health Statistics.[7]

Statistical Analysis

Baseline characteristics of the participants were tabulated and compared by CVH status. ANOVA was used to compare continuous variables while chi-square was used to compare categorical variables.

Multivariable logistic regression analysis was used to examine the cross-sectional association between CVH and SMI. Odds ratios (ORs) and 95% CIs were calculated comparing intermediate CVH (LS7=5–9) and ideal CVH (LS7=10–14) to poor CVH (LS7=0–4), and also per 1-unit increase in the sum of LS7 score. In both approaches, model 1 was adjusted for age, sex, race, and total annual family income. Model 2 adjusted for model 1 plus alcohol intake, stroke, prior heart failure, and C-reactive protein.

A similar analysis was conducted in subgroups stratified by age (≤65 years versus >65 years), sex, and race (white versus nonwhite).

To examine the impact of the concomitant presence of CVH and SMI on the associations of each with CVD mortality, we used SMI and CVH in 2 different ways in 2 sets of Cox proportional hazard models. First, we used different combinations of SMI and CVH categories as follows: "no SMI+ideal CVH (reference)"; "SMI+ideal CVH"; "no SMI+intermediate CVH"; "SMI+intermediate CVH"; "no SMI+poor CVH"; and "SMI+poor CVH." Second, we reported hazard ratios (HRs) and 95% CIs of association of SMI with CVD mortality across CVH categories. Models were adjusted for potential confounders as mentioned above.

All statistical analyses were performed using SAS version 9.4 (SAS Institute), and *P* values were considered significant if <0.05.

Results

Among the 6766 participants included in the analysis (aged 59.1±13.3 years, 53.9% women, 49.3% non-Hispanic whites, and LS7 score 7.6±2.1), ≈7.6% (n=514) had poor CVH, 20.2% (n=1372) had ideal CVH, and the remaining 72.1% (n=4880) had intermediate CVH. The prevalence of SMI exponentially increased as CVH worsened (SMI prevalence 2.9%, 2.0%, and 0.58% in poor, intermediate, and ideal CVH, respectively). Only 0.12% (n=8) participants had all ideal CVH components. Table 1 shows the baseline characteristics by LS7 CVH categories. Participants in the poor CVH category were more likely to be old, women, nonwhite, heavy drinkers, and belong to poor socioeconomic status and to have prevalent congestive heart failure and stroke. Figure S1 shows the prevalence of individual LS7 components with the categories, ie, poor, intermediate, and ideal.

In a model adjusted for sociodemographics, ideal, compared with poor CVH, was associated with lower odds of SMI (*P*=0.002). A similar trend of lower odds of SMI was observed with further adjustments for other potential confounders (*P*=0.007). Each 1-unit increase in LS7 score was associated with a 15% lower prevalence of SMI (*P*=0.0009) (Table 2).

The cross-sectional associations of CVH categories with SMI were consistent in subgroups of the study participants stratified by age, sex, and race (Table 3).

Table S1 shows the association of SMI with the individual LS7 component. As shown, compared with poor CVH level of each component, ideal BP, TC, smoking status, and glycated hemoglobin were associated with lower odds of SMI.

During a median follow-up of 14 years, 907 CVD deaths occurred. As shown in the Figure, the incidence rates of CVD mortality were generally higher among the study participants who had SMI than those without SMI. These rates were even higher among those with both poorer CVH and SMI than those with better CVH and SMI (Figure).

Table 4 shows the associations of various combinations of CVH category and SMI with mortality. As shown, in a fully adjusted model, compared with the reference category,

Table 1. Baseline Characteristics of the Study Participants

Characteristics	Cardiovascular Health			P Value*
	Poor (LS7=0–4) n=514	Intermediate (LS7=5–9) n=4880	Ideal (LS7=10–14) n=1372	
Age, y	60.5±11.0	59.9±13.3	55.4±13.3	<0.0001
Men, No. (%)	238 (46.3)	2343 (48.0)	539 (39.2)	<0.0001
Non-Hispanic white, No. (%)	178 (34.6)	2316 (47.4)	844 (61.5)	<0.0001
Total annual income <$20 000, No. (%)	298 (59.4)	2342 (48.7)	408 (30.2)	<0.0001
Total cholesterol, mg/dL	250.1±43.1	221.6±43.1	193.7±34.1	<0.0001
Lipid-lowering medications, No. (%)	22 (4.3)	160 (3.2)	30 (2.1)	0.03
Systolic BP, mm Hg	146.0±19.1	134.6±19.0	118.9±14.6	<0.0001
Diastolic BP, mm Hg	80.6±11.1	77.1±10.3	72.0±8.0	<0.0001
Antihypertensive medications, No. (%)	199 (38.7)	1167 (23.9)	105 (7.6)	<0.0001
Alcohol, No. (%)				
Never	81 (16.0)	897 (18.6)	249 (18.4)	0.33
Moderate	45 (8.7)	810 (16.6)	376 (27.4)	<0.0001
Heavy	113 (22.0)	1076 (22.0)	252 (18.3)	0.01
C-reactive protein, mg/dL	0.70±0.84	0.51±0.76	0.39±0.87	<0.0001
Heart failure, No. (%)	32 (6.2)	117 (2.4)	15 (1.0)	<0.0001
Stroke, No. (%)	33 (5.9)	173 (3.3)	16 (1.1)	<0.0001
Glycated hemoglobin	7.1±1.9	5.8±1.2	5.2±0.4	<0.0001
Diabetic medications, No. (%)	125 (24.3)	373 (7.6)	9 (0.6)	<0.0001
Smoker, No. (%)				
Current	258 (50.1)	1165 (23.8)	93 (6.7)	<0.0001
Former	173 (33.6)	1644 (33.6)	335 (24.4)	<0.0001
Never	83 (16.1)	2071 (42.4)	944 (68.8)	<0.0001
BMI, kg/m^2	31.8±5.4	28.1±5.5	24.3±3.5	<0.0001
Healthy diet score	55.8±13.7	63.4±13.3	71.0±12.6	<0.0001
Physical activity (METs per week)†	0 (0–7.09)	8.4 (0.81–27.9)	24.4 (7.3–45.1)	<0.0001
SMI, No. (%)	15 (2.92)	99 (2.03)	8 (0.58)	0.0003

Values are expressed as mean±SD unless otherwise indicated.
BMI indicates body mass index; BP, blood pressure; LS7, Life's Simple 7; SMI, silent myocardial infarction.
*P value by ANOVA for continuous variables and chi-square for categorical variables.
†Metabolic equivalents (METs) per week are reported as median (interquartile range).

intermediate and poor CVH were associated with 41% and 177% increased risk of CVD mortality (HR, 1.41; 95% CI, 1.14–1.74) and (HR, 2.77; 95% CI, 2.10–3.66]), respectively. However, in the presence of SMI, this risk increased to 117% and 528% for intermediate CVH (HR, 2.17; 95% CI, 1.42–3.32) and poor CVH (HR, 6.28; 95% CI, 3.02–13.07), respectively.

Table 5 shows the association between SMI and CVD mortality across CVH subgroups. In a model adjusted for potential confounders, SMI predicted an increased risk of CVD mortality in the intermediate (HR, 1.57; 95% CI, 1.07–2.30) and poor CVH (HR, 2.55; 95% CI, 1.19–5.45) subgroups. On the other hand, SMI association with CVD mortality in ideal CVH did not reach statistical significance (HR, 2.41; 95% CI, 0.52–11.07 [interaction P=0.47]).

Discussion

There are several important findings demonstrated by this investigation from a large community-based population of adults without coronary heart disease. First, we found that better CVH, as defined by the LS7 score, was associated with a lower risk of SMI. Every 1-unit increase in LS7 score was associated with 15% lower odds of SMI. Second, we found that CVH may modify the risk of SMI. Specifically, SMI was

Table 2. Association Between Cardiovascular Health and SMI

CVH Categories	Model 1*		Model 2†	
	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
Poor	Reference	…	Reference	…
Intermediate	0.69 (0.39–1.24)	0.20	0.78 (0.43–1.40)	0.16
Ideal	0.25 (0.10–0.62)	0.002	0.31 (0.12–0.75)	0.007
LS7 per unit increase	0.84 (0.77–0.92)	0.0002	0.86 (0.78–0.94)	0.001

Odds ratios (ORs) and 95% CIs calculated from a logistic regression analysis. CVH indicates cardiovascular health; LS7, Life's Simple 7; SMI, silent myocardial infarction.
*Model 1 adjusted for age, sex, race, and annual income levels.
†Model 2 adjusted for model 1 plus alcohol use, C-reactive protein, prior congestive heart failure, and stroke.

associated with increased risk of CVD mortality in those with intermediate and poor CVH, but the association with ideal CVH did not reach statistical significance. Also, the concomitant presence of poor CVH and SMI was associated with the highest risk of CVD mortality, and the risk was the lowest among those with ideal CVH without SMI.

In an attempt to achieve improvements in CVH across the entire population, in 2010, the AHA recommended the use of the same 7 metrics as the primary means for monitoring overall CVH in the US population from 2010 to 2020.[13] Since then, many population-based studies have assessed the relationship between CVH metrics and incident CVD including MI,[1,14] stroke,[1,2,14,15] heart failure,[16] atrial fibrillation,[3] and venous thromboembolism. Using the data from the Northern Manhattan Study that included 2981 patients, Dong et al[1] showed a strong graded relationship between the presence of a greater number of the ideal CVH metrics at baseline and a markedly lower risk of incident MI. Similarly, a study by Miao et al,[14] who followed 91 598 patients for 2 years, found that each better health category of the CVH score was associated with reduced odds for MI. To the best of our knowledge, this is the first study to examine the association between CVH metrics and prevalence of SMI.

It is important to note that achieving ideal CVH is not easy. A recent systemic review by Younus et al[17] examined the prevalence and trends of the AHA's ideal CVH metrics in several population-based studies and found that in US studies, the prevalence of ideal CVH (defined as achieving 6 or 7 ideal CVH metrics) was as low as 0.5%,[18] and only 1 of the 14 US studies had a prevalence of ideal CVH >10%.[19] In our cohort, only 0.12% of participants met all 7 CVH metrics. Yang et al[11] examined trends in CVH metrics using data from NHANES 1988 through 2010. They found that the prevalence of meeting ≥6 CVH metrics decreased from 10.3% to 8.8%, and the prevalence of meeting ≤1 CVH metrics increased from 7.2% to 8.8%. We showed that the risk of CVD mortality was higher among those with poor CVH and intermediate CVH compared with those with ideal CVH even without SMI. This

Table 3. Association Between CVH and SMI in Sex, Race, and Age Subgroups

	CVH Categories	Events/Participants, No. (%)	OR (95% CI)*	Interaction *P* Value
Men	Intermediate (5–9 points)	55/2343 (2.3)	0.63 (0.30–1.33)	0.26
	Ideal (10–14 points)	2/539 (0.3)	0.11 (0.02–0.55)	
Women	Intermediate (5–9 points)	44/2537 (1.7)	1.05 (0.40–2.74)	
	Ideal (10–14 points)	6/833 (0.7)	0.66 (0.19–2.26)	
Whites	Intermediate (5–9 points)	51/2316 (2.2)	0.80 (0.31–2.09)	0.56
	Ideal (10–14 points)	7/844 (0.8)	0.40 (0.12–1.32)	
Nonwhites	Intermediate (5–9 points)	48/2564 (1.8)	0.80 (0.38–1.69)	
	Ideal (10–14 points)	1/528 (0.1)	0.13 (0.07–1.07)	
Age >65 y	Intermediate (5–9 points)	61/1742 (3.5)	0.60 (0.29–1.21)	0.74
	Ideal (10–14 points)	6/336 (1.7)	0.35 (0.12–1.01)	
Age ≤65 y	Intermediate (5–9 points)	38/3138 (1.2)	1.45 (0.49–4.32)	
	Ideal (10–14 points)	2/1036 (0.1)	0.25 (0.04–1.45)	

Reference=(poor cardiovascular health [CVH]). OR indicates odds ratio; SMI, silent myocardial infarction.
*Model adjusted for age, sex, race, annual income, alcohol intake, C-reactive protein, prior congestive heart failure, and stroke.

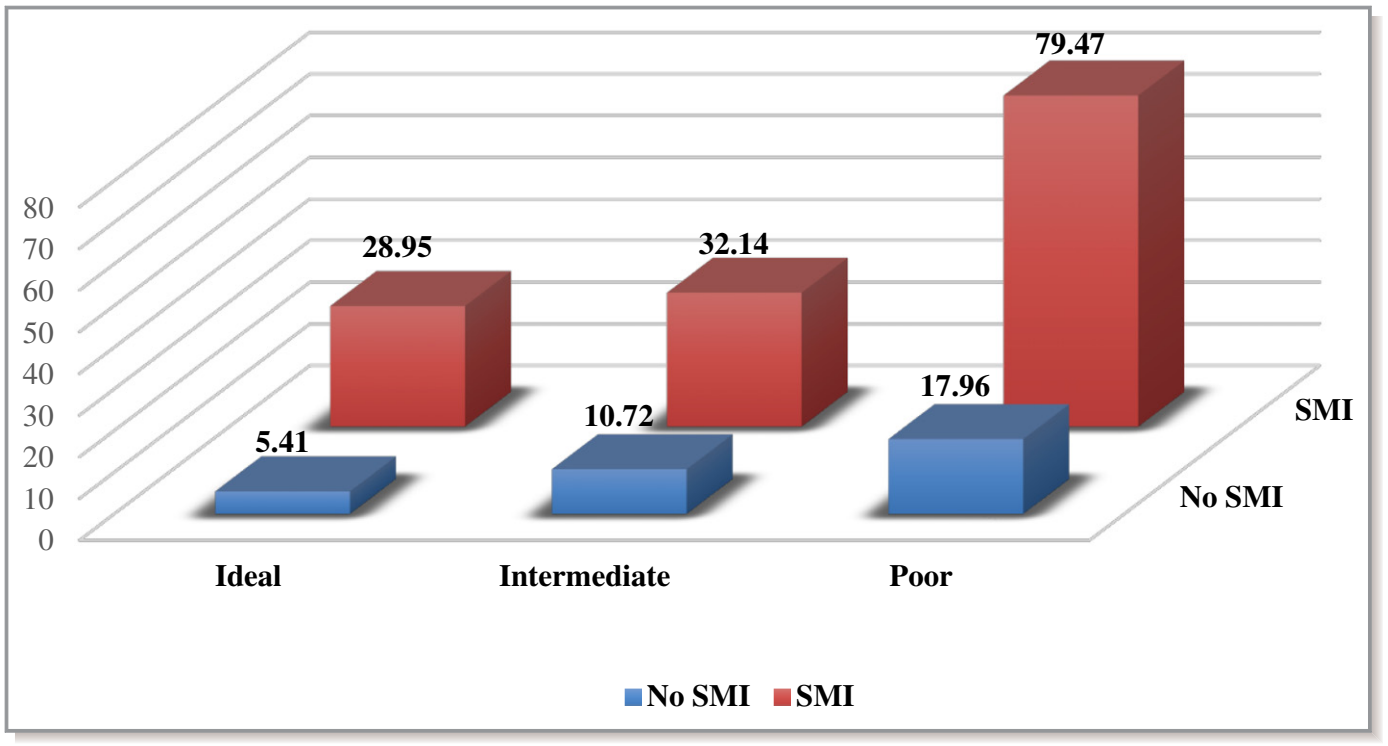

Figure. Incidence rates* of cardiovascular disease mortality stratified by cardiovascular health and silent myocardial infarction (SMI) status. *Incidence rate per 1000 person-years.

finding again reiterates that achieving ideal CVH status is highly beneficial regardless of other comorbidities.

Previous reports from different populations have shown that the prognosis of SMI is as unfavorable as recognized MI.[4,20,21] Moreover, studies have also shown the prognosis of silent MI with respect to risk for other CVD including heart failure,[5,22] atrial fibrillation,[6] and stroke.[23] Our study showed that the concomitant presence of poor CVH and SMI was associated with a 6-fold increased risk of CVD mortality compared with those without SMI with ideal CVH. Our study is consistent with several prior studies that have revealed that SMI is not a benign condition and is associated with increased risk of poor outcomes.[21,24–27] In light of our findings, a screening ECG may provide further risk assessment for individuals with poor CVH metrics who otherwise may not receive appropriate diagnosis because of a lack of symptoms. Our study reemphasizes the importance of LS7 score as a simple and convenient tool to assess lifestyle impact on CVD risk.

Study Strengths and Limitations

The strength of our study includes its large sample size, community-based and multiracial population, and better

Table 4. Association Between CVH and CVD Mortality in the Presence and Absence of SMI

CVH Categories	SMI	Events/Participants, No. (%)	Model 1*		Model 2†	
			HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
Ideal	Absent	102/1364 (7.4)	Reference	…	Reference	…
	Present	2/8 (25.0)	1.59 (0.39–6.46)	0.51	0.93 (0.22–3.88)	0.92
Intermediate	Absent	657/4781 (13.7)	1.45 (1.17–1.80)	0.0005	1.41 (1.14–1.74)	0.001
	Present	30/99 (30.3)	2.46 (1.62–3.74)	<0.0001	2.17 (1.42–3.32)	0.0003
Poor	Absent	107/499 (21.4)	3.08 (2.33–4.06)	<0.0001	2.77 (2.10–3.66)	<0.0001
	Present	9/15 (60.0)	7.50 (3.63–15.49)	<0.0001	6.28 (3.02–13.07)	<0.0001

Hazard ratio (HR) and 95% CI calculated from Cox proportional hazard analysis. CVD indicates cardiovascular disease; CVH, cardiovascular health; SMI, silent myocardial infarction.
*Model 1 adjusted for age, sex, race, and total annual income.
†Model 2 adjusted for model 1 plus alcohol use, C-reactive protein, prior congestive heart failure, and stroke.

Table 5. Association Between SMI and CVD Mortality Across CVH Subgroups

CVH Subgroups	SMI Status	Event/Participants, No. (%)	Model 1*		Model 2†	
			HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
Ideal	Absent	102/1364 (7.4)	Reference	…	Reference	…
	Present	2/8 (25.0)	1.52 (0.36–6.34)	0.55	2.41 (0.52–11.07)	0.25
Intermediate	Absent	657/4781 (13.7)	Reference	…	Reference	
	Present	30/99 (30.3)	1.74 (1.19–2.53)	0.003	1.57 (1.07–2.30)	0.02
Poor	Absent	107/499 (21.4)	Reference	…	Reference	…
	Present	9/15 (60.0)	2.76 (1.32–5.78)	0.006	2.55 (1.19–5.45)	0.01

CVD indicates cardiovascular disease; CVH, cardiovascular health; HR, hazard ratio; SMI, silent myocardial infarction.
*Model 1 adjusted for age, sex, race, and total annual income.
†Model 2 adjusted for model 1 plus alcohol use, C-reactive protein, prior congestive heart failure, and stroke.

generalizability of the US population. In addition, our data included well-ascertained variables and outcomes, including ECG data evaluated at a central reading center. Study limitations include the cross-sectional analysis of the association between CVH and SMI, and, therefore, a causal relationship between CVH and SMI could not be established. SMI did not predict an increased risk of mortality in participants with ideal CVH, but lack of power remained a limitation of the study given a small number of participants who belonged to the ideal CVH subgroup and had SMI. However, at the same time, we cannot ignore the fact that it is also less likely to find the combination of ideal CVH and SMI, an important finding of our study. Another limitation of the study includes residual confounding, which remained a possibility in all analyses despite the adjustment of several confounders. Finally, some of the measurements such as smoking and physical activity were self-reported and thus subjected to recall bias.

Conclusions

We observed that ideal CVH is associated with a lower prevalence of SMI. Intermediate and poor CVH predicted the worst prognosis in the presence of SMI and vice versa. These results further highlight the importance of maintaining ideal health.

Disclosures

None.

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