Underutilization of Cardiovascular Medications among Individuals with New Cardiovascular Events

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space for abstract

BACKGROUND

• More than 1 million Americans die each year from myocardial infarction and other forms of CHD[1]

• Various national guidelines recommend the following pharmacotherapies for treatment and prevention of CV disease[2-4]
  - ACE inhibitors for all patients with CV disease, early post MI, LV systolic dysfunction, diabetes, or chronic kidney disease, unless contraindicated
  - ARBs for those intolerant of ACE inhibitors
  - Beta-blockers for those with MI, acute coronary syndrome, or LV systolic failure
  - Antiplatelet or anticoagulant agent for those with acute coronary syndrome or PCI or MI, and aspirin for all patients with CHD unless contraindicated
  - Lipid-lowering drug therapy for individuals with CHD or at moderate CHD risk

• Limited information is available for individuals with CHD living in the community and their physicians regarding adherence to the AHA/ACC guidelines for secondary prevention of CV disease

OBJECTIVE

• Evaluate the utilization of prescription CV therapies and aspirin among individuals with a new CV event to assess adherence to recent guidelines

METHODS

Study Design

• **S**tudy to **H**elp **I**mprove **E**arly evaluation and management of risk factors **L**eading to **D**iabetes (SHIELD), a population-based survey conducted to better understand the risk for the development of diabetes, as well as disease burden
  - Based upon a screening questionnaire mailed to 200,000 nationally representative households, responses were obtained for 211,097 adults from 127,420 households (64% response rate)
  - A 64-item survey (baseline survey) was sent to 22,001 individuals derived from the screening respondents to understand health status, attitudes and behaviors, anthropometry, and medication use
  - Annual follow-up surveys were sent to individuals responding to the baseline survey. The 2005 survey had a response rate of 72%, and the 2006 survey had a response rate of 75%

• Longitudinal analysis of CV events and use of CV drug therapies among SHIELD respondents

Study Population

• Respondents were 18 years of age or older

• CV event was defined as self-report of heart attack/heart disease, stroke, heart bypass surgery, or angioplasty

• New CV event was defined as no CV event reported at baseline but reported event in Year 1 or Year 2 follow-up survey (i.e., during 2 years of follow-up but not at baseline)

Therapy Assessment

• Respondents reported the name of each medication currently prescribed to them. They were instructed to refer to their medication labels for accurate reporting

• Lipid-lowering (antidyslipidemia) medications included statins, fibric acid derivatives, bile acid sequestrants, cholesterol absorption inhibitors, and combination therapy. Statin therapy included both monotherapy and combination therapy

• Antiplatelet and anticoagulant agents included clopidogrel, ticlopidine, cilostazol, dipyridamole, warfarin, and low–molecular-weight heparins

• For aspirin use, respondents who indicated that they took aspirin every day "most of the time" or "always" were considered daily users (versus those reporting "sometimes or occasionally" or "not currently"). Daily aspirin was then included with the prescription antiplatelet and anticoagulant agents

• Antihypertensive medications included ACE inhibitors, ARBs, and beta-blockers

Statistical Analyses

• Proportion of respondents with a new CV event who reported drug treatment was computed for:
  1) Use before and after CV event
  2) Use after event only
  3) Use before event only
  4) No use before or after event

RESULTS

• 9,497 SHIELD respondents completed the baseline, Year 1, and Year 2 surveys
• 23% of respondents reported a pre-existing CV event at baseline
• 953 respondents (10%) reported a new CV event over the 2 years of follow-up

Figure 1. Incidence of new CV events over 2 years
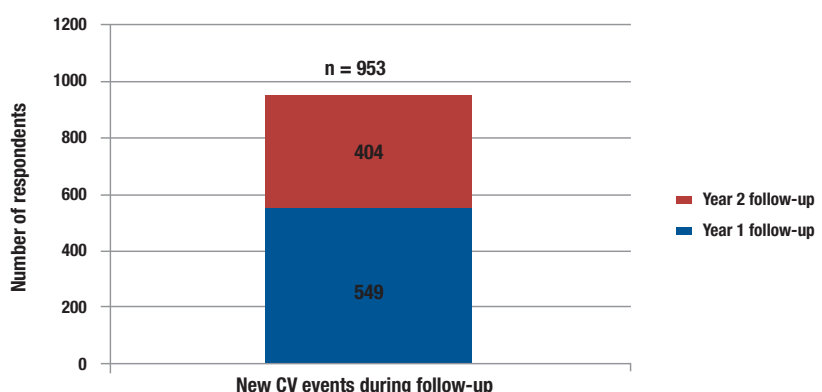
• 6% of respondents reported a new CV event in the first year of follow-up, and 4% reported an event in the second year

RESULTS (Continued)

Table 1. Characteristics of SHIELD respondents with a new CV event during 2 years of follow-up

Characteristics	Respondents with new CV event n=953
Age, years, mean (SD)	59.7 (14.5)
Women, %	64
Race, % white	85
Education, % with some college or higher	65
Income, % ≥$35,000/year	47
Type 2 diabetes mellitus, %	31

• Respondents reporting a new CV event were mainly women and white, with some college education
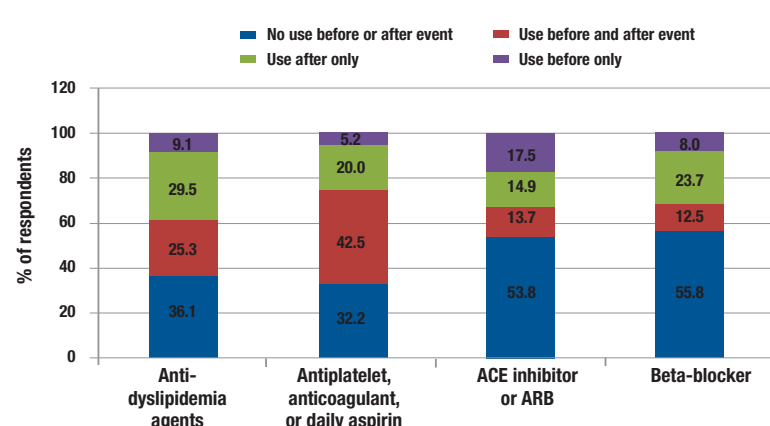
Figure 2. Type of CV event among incident cases
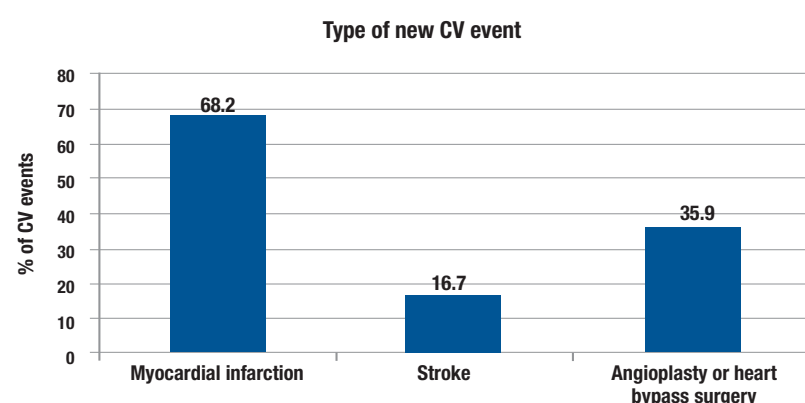
• There were 1,151 new CV events among the 953 respondents; 198 individuals reported 2 new events in the 2 years of follow-up

• MI was the most common CV event

Therapy Utilization

**Figure 3. Utilization of CV medications before or after new CV event**

• 36% of respondents never took antidyslipidemia therapy before or after the event, and only 30% started this therapy after the event

• Antiplatelet/anticoagulant therapy or daily aspirin was not used by 32% of respondents, and an additional 20% of respondents started this therapy after their CV event

• Approximately 54% of respondents did not use ACE inhibitors or ARBs before or after their CV event, and utilization did not increase substantially after the event (15%)

• Similar to the ACE inhibitor and ARB utilization, beta-blockers were not used by 56% of respondents before or after their CV event

Figure 4. Utilization of CV medications by event type
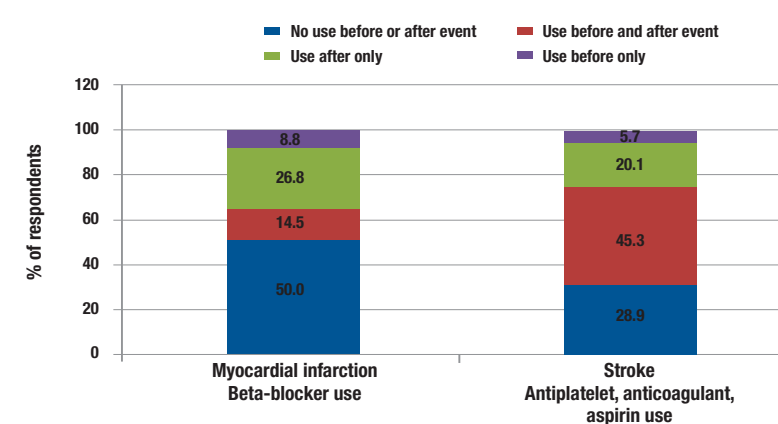
Myocardial infarction:

• 650 respondents reported a new MI during the 2-year period

• AHA/ACC guidelines recommend beta-blockers for individuals with MI

• 50% of respondents with a new MI did not take a beta-blocker either before or after their MI, and 8.8% used a beta-blocker only before their MI

Stroke:

• 159 respondents reported a new stroke during the 2-year period

• 45% of respondents with a new stroke were using antiplatelet agent, anticoagulant agent, or daily aspirin before and after their stroke

• An additional 20% of respondents started antithrombotic therapy after their stroke

LIMITATIONS

• Respondents were not asked the reason why they were taking aspirin daily; thus, their aspirin use may have been related to other chronic conditions such as arthritis or headaches

• The true clinical indication for each therapy class could not be assessed since blood pressure and cholesterol levels were not captured in the SHIELD survey

• Household panels, like the SHIELD study, tend to under-represent the very wealthy and very poor segments of the population and do not include military or institutionalized individuals

SUMMARY

• The incidence of CV events over 2 years was 10% among this sample of individuals with a high prevalence of type 2 diabetes mellitus

• AHA/ACC guidelines recommend drug therapy for primary and secondary prevention of CV disease, yet more than one third of respondents with an incident CV event were not taking antidyslipidemia agents (36%), antiplatelet/anticoagulant/daily aspirin (32%), or antihypertensive agents (i.e., ACE inhibitors, ARBs or beta-blocker) (>50%)

• Preventive drug therapy for MI (beta-blocker) was not taken by 50% of respondents with an incident MI

• Antithrombotic therapy utilization was higher among respondents with incident stroke, with 45% of respondents taking this therapy before and after their stroke and another 20% starting therapy after their stroke

CONCLUSIONS

• Based upon the study findings, the AHA/ACC treatment guidelines were not translated to practice for many respondents with incident CV events

• There remains opportunity for significant improvement in raising awareness and motivating at-risk individuals to adopt preventive measures for reducing CV disease, especially among respondents with MI

• Novel education programs may be required to increase the adoption of therapy guidelines among clinicians and their at-risk patients

List of Abbreviations

Abbreviation	Definition
ACE	Angiotensin-converting enzyme
ACC	American College of Cardiology
AHA	American Heart Association
ARB	Angiotensin II receptor blocker
CHD	Coronary heart disease
CV	Cardiovascular
LDL-C	Low-density lipoprotein cholesterol
LV	Left ventricular
MI	Myocardial infarction
PCI	Percutaneous coronary intervention
SHIELD	Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes

References
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2. Smith SC et al. Circulation 2006; 113:2363-2372
3. Mosca L. Arterioscler Thromb Vasc Biol 2004; 24:394-396
4. National Cholesterol Education Program ATP III JAMA 2001; 285:2486-2497