Adherence of cardiologist physicians to the American Heart Association guideline in approach to risk factors of cardiovascular diseases: An experience from a teaching hospital

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Short Communication

Abstract

BACKGROUND: Cardiovascular disease (CVD) is the leading cause of death globally and has enormous costs for healthcare systems. This disease has a strong association with lifestyle behaviors. Therefore, applying reliable and effective strategies for prevention and treatment of CVD is important. In this study, we aimed to evaluate the adherence of cardiologist physicians to the American Heart Association (AHA) guideline for prevention of CVD.

METHODS: Using a cross-sectional study, data were gathered for 208 patients using their medical records in the cardiology ward of a general teaching hospital. A physician systematically reviewed the medical records and completed the checklist in each domain. Adherence to the AHA guideline was evaluated in treating physician's choices and recommendations regarding these eight variables: hypertension (HTN), dietary intake, weight management, diabetes management, physical activity, blood lipid management, smoking, and aspirin prescription.

RESULTS: Medical records of 208 patients (109 men and 99 women) with the mean age of 62 ± 14 years were reviewed. The frequency of CVDs was 5.3% for coronary heart failure (HF) and 67.8% for the acute coronary syndrome (ACS). Cardiovascular risk factors of patients were HTN (53.8%), diabetes (34.6%), hyperlipidemia (17.3%), smoking (17.8%), and obesity (31.7%). We found a proportion of 59%, 15%, and 26% for high, moderate, and low adherence to AHA guideline, respectively.

CONCLUSION: Our study showed almost 60% high adherence to the AHA guideline by physicians in a teaching hospital. The most and the least adherence to the AHA guideline were for obesity and diabetes recommendations, respectively. More studies are needed to evaluate preventive guideline adherence in Iran. Establishing national preventive and therapeutic guidelines may increase the physicians' adherence to them.

Keywords: American Heart Association, Cardiovascular Diseases, Cardiologists, Guideline, Guideline Adherence

Introduction

Cardiovascular disease (CVD) is the leading cause of death globally and has huge costs for health care systems in many countries.[1] CVD, particularly coronary artery disease (CAD), is one of the most preventable non-communicable disorders that can be reduced by modifying behavioral risks.[2]

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CVD causes 38% of all deaths in Iran annually, and about 3 million people aged 40 and above die every year from ischemic heart diseases (IHDs) in Iran.[2]

The evidence suggests disturbing increase in the prevalence of CVD risk factors such as diabetes, obesity, and the metabolic syndrome.[3-5] High-risk behaviors such as cigarette smoking, unhealthy dietary habits, physical inactivity, and psychosocial factors have a strong association with CVD.[6] Furthermore, hypertension (HTN), diabetes, and dyslipidemia are under the influence of the unhealthy lifestyle.[7] World Health Organization (WHO) has announced that lifestyle modification can prevent 75% of CVDs.[2]

Recommendations of international guidelines are the most effective way of ensuring that patients receive optimal care.[8] Physician adherence to cardiovascular preventive care guidelines is one of the critical steps to improve the outcomes of patients. Moreover, using guidelines can improve clinical practice.[9] Another study showed that use of guideline-based therapies was associated with significant reduction in mortality and other major adverse outcomes.[10]

For prevention and management of CVD, the American College of Cardiology (ACC) and the American Heart Association (AHA) develop guidelines, standards, and policies to promote optimal patient care and cardiovascular health.[11] The proposed guideline is one of the most reliable guides that are widely used in CVD prevention. It consists of recommendations for the control of blood glucose, lipids, weight, and blood pressure, encouragement of physical activity, safe diet, and also aspirin usage.[11] According to the importance of CVD in population health and its socio-economic consequences, applying reliable and effective strategies for prevention and treatment of these diseases is important. In this study, we aimed to evaluate the adherence of Iranian physicians to the AHA guideline for CVD prevention.

Materials and Methods

In this cross-sectional study, data about physicians' adherence to the AHA guideline were collected from medical records of patients admitted to the cardiology ward of a general teaching hospital of Iran University of Medical Sciences in Tehran City, Iran. Data collection was conducted from April 4 to July 6, 2015. Eligible patients were those who were admitted to the cardiology ward with one of the following diagnoses: IHD, HTN, heart failure (HF), or stroke. We excluded all records that were incomplete or free of CVD.

A data collection checklist was developed for the evaluation of the adherence to the AHA guideline and was completed for each patient using his/her medical records. The selection of checklist domains was performed by an expert panel consisting of experts in relevant medical specialties including community medicine, cardiology, and endocrinology, and eight risk factors were selected for inclusion in the checklist. Adherence to the AHA guideline was evaluated in treating physicians' choices and recommendations regarding these eight variables: HTN, dietary intake, weight management, diabetes management, physical activity, blood lipid management, smoking, and aspirin prescription.

A physician systematically reviewed the medical records and completed the checklists in each domain.

At first, she examined the number of existing risk-factors for each patient. Then, she compared the physicians' recommendations in each patient's medical record with the AHA guideline to determine the number of well-treated risk factors. The next step was to calculate the adherence to the AHA guideline by dividing the first number by the second. The total adherence to the AHA guideline was illustrated in percentage. Finally, we considered an adherence for less than 50%, 50%-80%, and more than 80% of risk factors as a low, moderate, and high adherence, respectively, according to expert opinions in the hospital.

Treatment goals for each variable were as follows:

• *HTN:* the target blood pressure was 130/80 for diabetes and 140/90 for the others. Moreover, prescribing proper antihypertensive medications from different classes in cases of high blood pressure was a desirable goal for HTN.

• *Dietary intake:* getting recommendations for an overall healthy eating pattern or following the recommendations by the patients.

• *Aspirin:* prescribing a low-dose aspirin for individuals at higher risk of coronary heart disease (CHD), especially those with the 10-year risk of CHD ≥ 10%.

• *Weight management:* achieving and maintaining a desirable weight [body mass index (BMI): 18.5–24.9 kg/m²]. Furthermore, it was a goal that patients received proper recommendations about their weight when their BMI was ≥ 25 kg/m² or their waist circumference at iliac crest level was equal or more than 40 inches in men or ≥ 35 inches in women.

- *Diabetes management:* reaching normal fasting plasma glucose (110 mg/dl) or near normal hemoglobin A1c (HbA1c) (7%).
- *Physical activity:* at least 30 minutes of moderate-intensity physical activity on most/all days of the week or recommending this.
- *Blood lipid management:* low-density lipoprotein cholesterol (LDL-C) < 160 mg/dl if at least one risk factor was present. LDL-C < 130 mg/dl if two risk factors were present and the 10-year risk of CHD < 20%. LDL-C < 100 mg/dl if two risk factors were present and the 10-year risk of CHD ≥ 20% or if the patient had diabetes.
- *Smoking:* complete cessation and no exposure to environmental tobacco smoke.

All statistical analyses were performed using the SPSS software (version 16, SPSS Inc., Chicago, IL, USA). Categorical variables were described as frequency and percentage. Also, continuous variables were reported by mean ± standard deviation (SD).

For calculating the total adherence to the AHA guideline, we divided the number of the well-treated risk factors (in accordance to the AHA guideline) by a total number of the existing risk factors in the patients. The final results were reported in percentage.

Study protocols and procedures have been approved by the review board of Iran University of Medical Sciences.

Results

208 patients (109 men and 99 women) with mean age of 62 ± 14 years were admitted during the study duration and their medical records were reviewed. Frequency of CVD and risk factors are shown in table 1.

Adherence to the AHA guideline was first evaluated for each risk factor separately, and the results are shown in table 2. These included: HTN, diabetes, obesity, hyperlipidemia, and smoking. Among the studied risk factors, obesity treatment

had the highest adherence to the AHA guideline (100%) followed by smoking (86.5%). The least adherence was for diabetes with only 31.9%.

Table 1. Baseline clinical characteristics of the study population

Type of CVD	Women (n)	Men (n)	Total [n (%)]
CHF	9	2	11 (5.3)
ACS	59	82	141 (67.8)
Arrhythmia	6	1	7 (3.4)
Type of cardiovascular risk factor			
HTN	69	43	112 (53.8)
Diabetes	40	32	72 (34.6)
Hyperlipidemia	23	13	36 (17.3)
Smoking	3	34	37 (17.8)
Obesity	39	27	66 (31.7)

CVD: Cardiovascular disease; ACS: Acute coronary syndrome; CHF: Congestive heart failure; HTN: Hypertension

Recommendation of healthy alternatives for lifestyle risk factors according to the AHA guideline was investigated as shown in table 3. These included: healthy diet recommendation, physical activity, and aspirin prescription. The results of adherence to the AHA guideline are shown in table 4.

According to the scoring, 59% of the records indicated a high degree of adherence by physicians in the cardiovascular unit of one teaching hospital; 15% of the files showed a medium adherence, and 26% of them illustrated low adherence by physicians.

Discussion

This study has been done by evaluation of 208 patients' medical records who were admitted to the cardiovascular unit of one general teaching hospital. Adherence to the AHA guideline by the treating cardiovascular specialists was evaluated. Our study showed 59% high, 15% moderate, and 26% low adherence to the guideline by physicians in this teaching hospital.

Table 2. Adherence to the American Heart Association (AHA) guideline based on the presence of cardiovascular risk factor in the study population

Risk factor	Patients with the risk-factor (n)	Non-adherence to the AHA guideline recommendation [n (%)]	Full adherence to the AHA guideline recommendation [n (%)]
HTN	112	23 (20.5)	89 (79.5)
Smoking	37	5 (13.5)	32 (86.5)
Hyperlipidemia	36	15 (41.5)	21 (58.5)
Diabetes	72	49 (68.1)	23 (31.9)
Obesity	66	0 (0)	66 (100)

AHA: American heart association; HTN: Hypertension

Table 3. Adherence to preventive measures according to the American Heart association (AHA) guideline

Preventive measure	Non-adherence to the AHA guideline recommendation	Full adherence to the AHA guideline recommendation
	[n (%)]	[n (%)]
Healthy diet recommendation	115 (55.3)	93 (44.7)
Physical activity recommendation	118 (56.7)	90 (43.3)
Aspirin prescription	42 (20.2)	166 (79.8)

AHA: American heart association

Table 4. Adherence to the American Heart Association (AHA) guideline

Adherence	Percentage
High	59
Moderate	15
Low	26

In one study which was done in Shahid Modarres Hospital, Tehran City, 52.9% of physicians did not adhere to ACC/AHA guidelines in patients with unstable angina,[12] which is almost in accordance to our study findings (41%). The increase in our adherence result can be due to the fact that current health system pays more attention to the prevention of chronic CVDs. WHO has mentioned that 3/4 of all cardiovascular-related deaths can be prevented by changing one's lifestyle.[2]

Smoking is one of the most important behavioral risk factors for CVD.[13] In this study, 17.8% of the patients were smoker, and smoking cessation was advised to 68.7% of them. There is a relationship between blood pressure levels and occurrence of CVD even in blood pressures that have been defined as normal. In this study, 53.8% of patients had HTN, among which 79.5% had been followed.

High cholesterol/triglyceride (TG) and low high-density lipoprotein (HDL) levels are associated with the occurrence of CVD.[14] In developed countries, cholesterol level is increasing, which is mostly because of the low level of activity and increased fat consumption. In our 208 patients, 36 had hyperlipidemia, from which 21 received diet recommendations and 15 patients did not receive any recommendation. We know that each 1% decrease in blood cholesterol level can cause a 2%-5% decrease in CVD occurrence.[14] In this study, 79.8% of patients were on aspirin that is an effective way to decrease CVD.

Other recommendations in the AHA guideline which have been used in this study were obesity, diabetes, physical activity, and diet. We found that 44.7% of patients were advised to eat more vegetables and fruits and decrease their dietary salt and fat intake. No dietary recommendation was given to 55.3% of patients.

Changes in diet and lifestyle are vital in preventing CVD and cardiovascular deaths.[15] That's why the change of lifestyle and having a healthy diet are among the most important recommendations of the 2006 AHA guideline. According to our study, less than half of the patients did not receive any lifestyle recommendation, noting an important gap between adherence to the therapeutic recommendations of the guideline and the preventive part of that. In Spain, the researchers studied the percentage of adherence to ACC/AHA guidelines and its effects on changing the survival of patients with atrial fibrillation (AF). They found that using the guideline increased the survival of patients with AF up to 3 years.[16]

A study in Croatia showed that although most specialists believed that guidelines were beneficial, only 56.9% used them.[17] HTN was thought to be the most important risk factor by primary care physicians, but diabetes was thought as the most important risk factor by the cardiologist. As mentioned before, guideline-based treatment for patients can reduce mortality and major adverse outcomes.[10,18] Furthermore, most of the physicians accepted guidelines but only half of them used guidelines, and their knowledge about the guidelines was not satisfactory.[17] Also in a study, physicians' adherence to the guideline was significantly lower in nonteaching clinics.[19] Thus, these reasons as well as the lack of time, resources, and knowledge are most likely the main causes of poor management of the risk factors.[17]

Our study had some limitations such as incomplete records and taking data from medical records of the patients. Conducting study in just one general teaching hospital with the probability of more adherence to the guideline is another limitation and reduces generalizability of findings.

The strength point of the current study was to assess the prevention and risk factors of CVDs besides the treatment approach. Majority of previous studies have just considered the treatment approach to CVDs. We suggest further studies to focus on adherence to especially preventive

guidelines using prospective studies with more supervision of gathering data.

Conclusion

Our study showed 59% high, 15% moderate, and 26% low adherence to the AHA guideline by physicians in the cardiology ward of one teaching hospital. The most adherence to the AHA guideline was about obesity (100%), smoking (86.5%), aspirin prescription (79.8%), and blood pressure (79.5%), respectively. The less adherence was about diabetes (31.9%).

More studies are needed to evaluate preventive guideline adherence in Iran. Establishing national preventive and therapeutic guidelines may increase the physicians' adherence to them and finally promote the health of people.

Conflict of Interests

Authors have no conflict of interests.

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