

Prediction of 10-year risk of hard coronary events among Saudi adults based on prevalence of heart disease risk factors



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Aim: Cardiovascular disease is becoming the lead cause of mortality and morbidity worldwide, and developing countries are the main contributors to this trend. Saudi Arabia, which is considered a rapidly developing country, faces progressive urbanization and the adoption of a westernized lifestyle, factors which contribute to the rising burden of cardiovascular disease. Our study evaluates the prevalence of coronary risk factors and predicts hard coronary artery events over 10 years in an urban Saudi cohort.

Methods: A cross-sectional observational study was conducted on a Saudi population. The study involved Saudi subjects aged more than 20 years without a history of coronary heart disease. Demographic variables and hard coronary events (HCE) risk factors were measured. Each subject's 10-year HCE risk was estimated by means of the Framingham Risk Score (FRS).

Results: A total of 4932 subjects (2215 men and 2717 women) were examined, the majority (85%) of whom were less than 40 years old. The risk of developing HCE within the next 10 years was low in 92.6% of subjects, intermediate in 3.2% and high in 4.1%. On considering diabetes as coronary heart disease (CHD) risk-equivalent, 26% of subjects were at high risk for hard coronary events in 10 years. The HCE risk progressively increased with age and was higher in men.

Conclusions: Our study, the first to estimate the 10-year risk of HCE among adults in an emerging country, determined that a significant proportion of a younger aged population is at risk for the development of hard coronary events. Public awareness programs to control risk factors are warranted.

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Abbreviations and Acronyms

CVD	cardiovascular disease
ACS	acute coronary syndrome
HCE	hard coronary events
BMI	body mass index
TC	total cholesterol
HDL-C	high-density lipoprotein cholesterol
LDL-C	low-density lipoprotein cholesterol
FHS	Framingham Heart Study
CHD	coronary heart disease

Introduction

According to the World Health Organization, out of a total of 58 million deaths worldwide in 2005, 30% were due to cardiovascular diseases, mainly heart disease and stroke. The common modifiable risk factors identified were unhealthy diet, physical inactivity, tobacco use, high blood pressure and blood glucose, abnormal blood lipids, and being overweight [1].

By the year 2020, cardiovascular disease (CVD) will be the leading cause of mortality and morbidity worldwide, and developing countries will be the main contributors to this increase [2-5]. In general, developing nations continue to be relatively ill-equipped to handle this burden, and, coupled with poor literacy rates and a lack of awareness regarding disease-related symptoms and associated risk factors, the result is worse disease outcomes [6]. This is reflected in the rising rates of CVD-related hospital admissions and mortality among younger subjects, which in turn inflates disability-adjusted life-years [7,8].

Saudi Arabia, considered a rapidly developing country, faces progressive urbanization and the fast adoption of a western lifestyle, factors which contribute to the rising burden of cardiovascular disease. The SPACE Registry was the first registry in Saudi Arabia to look at patients with acute coronary syndrome (ACS) and showed that patients diagnosed with ACS in Saudi Arabia are from eight to eleven years younger than homologous patients in ACS registries in developed countries [9].

Although data on the prevalence of coronary disease risk factors in developing countries are limited, the prevalence observed is alarming. Risk stratification is therefore central to the management of heart disease. We conducted an observational study to evaluate the prevalence of coronary risk factors among the healthy Saudi population and to predict the 10-year risk of hard coronary events (HCE), defined as myocardial infarction or coronary death (see Fig. 1).



Figure 1. Age-specific distribution of risk for hard coronary events among Saudi adults (age ≥ 20 years) without self-reported CHD. Dark $\geq 20\%$; grey 10% to 20%; light grey $\leq 10\%$.

Methods

Project design and patient population

A community-wide, cross-sectional, observational study was conducted on the Saudi population. The study was conducted in compliance with the Declaration of Helsinki. All subjects gave voluntary consent to participate in the study after receiving adequate information on the research aims and methods.

Saudis aged more than 20 years who had no history of coronary heart disease and who attended the 2010 cultural festival in Riyadh were included in the study. These subjects are considered

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