Physical inactivity as a risk factor for coronary heart disease: a WHO and International Society and Federation of Cardiology position statement*

F.C.H. Bijnen,1 C.J. Caspersen,2 & W.L. Mosterd1

Coronary heart disease is responsible for a considerable amount of the morbidity and mortality from chronic diseases in industrialized countries. Many countries have therefore adopted prevention policies designed to reduce the prevalence of three of the major risk factors for coronary heart disease — high serum cholesterol, smoking, and high blood pressure. Physical inactivity is, however, also an important risk factor for developing coronary heart disease. This article presents a position statement by WHO and the International Society and Federation of Cardiology on physical inactivity and coronary heart disease.

Introduction

Coronary heart disease contributes much to the burden of morbidity and mortality from chronic diseases in industrialized countries. Three major risk factors—high serum cholesterol, smoking, and high blood pressure—are known to affect adversely coronary heart disease. Many countries have accordingly adopted prevention policies designed to reduce the prevalence of these three risk factors and, in turn, alleviate the burden of coronary heart disease in their populations. Like these three risk factors, physical inactivity is associated with about a twofold increased risk of developing coronary heart disease (1). Since physical inactivity is also highly prevalent in virtually all industrialized countries, it should have a place in this list of important modifiable risk factors.

Physical inactivity: a risk factor for coronary heart disease

In most observational studies an association between physical inactivity and an increased risk of coronary heart disease has been identified (1). No randomized controlled trials have focused, however, on the effect of eliminating physical inactivity on coronary heart disease in general populations. Policy-makers considering the significance of physical inactivity in coronary heart disease therefore have to rely on expert assessment of the available data. Experts have essentially accomplished this by applying the same criteria previously used to assess the harmful effects of smoking on lung cancer.

In this way it has been concluded that a harmful, positive association exists between physical inactivity and the incidence of coronary heart disease (1). This association has the following characteristics:

— it is consistently observed in a variety of settings (and especially in most of the better-designed studies);
— it is strong (i.e., the most inactive people have an almost twofold greater risk than the most active people, and the magnitude of the association is similar to that for the other three important risk factors for coronary heart disease);
— it is appropriately sequenced (i.e., assessment of the physical activity level predates the onset of coronary heart disease);
— it is biologically graded (i.e., the risk increases with decreasing physical activity); and
— it is plausible and coherent, as reflected by existing scientific knowledge.

Physical inactivity may result in coronary heart disease through various physiological mechanisms, which relate partly to detrimental effects on blood pressure, serum lipoprotein profiles, as well as insulin and glucose metabolism (2). Each of these effects may have a subsequent influence on atherosclerotic processes. Most studies that have statistically adjusted for the confounding effects of the traditional risk factors indicate that physical inactivity is also an independent risk factor for coronary heart disease (1). Because this finding has not been demonstrated in all studies, however, the issue is still the subject of some discussion. Regardless of the precise nature of the mechanism, physical inactivity is, nevertheless, an important risk factor for coronary heart disease.

Impact of physical inactivity on public health

Technological progress in industrialized countries has generally led to decreasing physical activity in most jobs (3). Therefore, public health attention often focuses on eliminating leisure-time physical inactivity, which is highly prevalent compared with the prevalence of the traditional risk factors for coronary heart diseases (4). In the USA, for example, an estimated 56% of men and 62% of women fail to engage in regular leisure-time physical activity (i.e., at least three times per week for 20 minutes per session), and 25% of men and 30% of women perform no leisure-time physical activity (5).

The health benefits of physical activity are not restricted to the primary prevention of coronary heart disease (6–14), although this is the focus of the present statement. For example, physical activity is linked to the secondary prevention of cardiovascular disease (7–9). Through regular physical activity, patients who have had myocardial infarction or who have stable angina pectoris can reduce their symptoms and substantially increase their functional capacity. Furthermore, the results of a meta-analysis strongly indicate that exercise after myocardial infarction reduces mortality. The benefits of physical activity in the prevention and treatment of other chronic diseases and conditions, in particular osteoporosis, hypertension, and obesity, are also gaining acceptance (6, 12–14).

The burden of physical inactivity on public health can be estimated using population-based studies. The population-attributable risk can be calculated by combining prevalence estimates and relative risks for selected risk factors in a study population. This concept offers a balanced view between the need to deal with stronger risk factors that affect fewer people versus the need to deal with weaker risk factors that are far more prevalent in a population (4).

The population-attributable risk has been estimated by several workers; the findings indicate that physical inactivity has a major effect on all-cause mortality, fatal and non-fatal myocardial infarction, and sudden coronary death (15–19). In these studies, the magnitude of the relative risk for reduced levels of physical activity was often found to be less than that of the relative risk for other selected risk factors. Mainly because of the large number of physically inactive people in each study, the population-attributable risk was often greater for reduced physical activity than for the other risk factors (4, 6). Because comparisons such as these are sensitive to the choice of risk factor cut-off points, the definitions employed have to be taken into consideration. In view of its potential effect on the populations of industrialized countries throughout the world, physical inactivity is at least as important a public health concern as the other three major risk factors for coronary heart disease.

Physical inactivity and prevention policy

Physical inactivity should be considered to be an important risk factor for coronary heart disease and should be included in prevention policies, particularly in industrialized countries, where physical inactivity is highly prevalent. At the same time, developing countries should also begin formulating policies to enhance leisure-time physical activity as work-related physical activity declines.

Because physical inactivity is a modifiable risk factor, industrialized countries should set concrete policy objectives for physical activity. Promoting physical activity as a policy endeavour need not be expensive. Moreover, physical activity can be readily enjoyed and can benefit persons of all ages, sexes, cultures, and socioeconomic backgrounds. Now is the time to promote physically active lifestyles worldwide.
Promoting physically active lifestyles

It has been known for years that regular physical activity that is intensive enough to improve and maintain cardiorespiratory fitness confers benefits to the heart. Also, some studies have found that persons who engage in large amounts of vigorous activities or sports have a lower risk of a heart attack than persons who engage in large amounts of less intensive activities (19). However, even a little physical activity is beneficial for otherwise inactive people. Recent studies have shown that, when performed regularly, light-to-moderate physical activity which uses large muscle groups helps to lower the risk of coronary heart disease (6, 7). Hence, participation in less intensive activities may be beneficial for many people, even if such participation does not produce maximum gains in cardiorespiratory fitness. This finding is encouraging since inactive people who decide to adopt an active lifestyle are likely to perform less intensive forms of activity. Furthermore, such forms of activity participation are less likely to result in injury (20).

In becoming physically active, people should start out slowly and gradually increase the frequency and duration of their participation over time, while using large muscle groups (21). A minimum level for light-to-moderate intensity physical activity is exemplified by a sustained walk (22). This level is feasible for most people. Other everyday activities, e.g., cycling, stair-climbing, gardening, etc., may also produce important health benefits, providing they sustain the use of large muscle groups and are performed at a level that is at least somewhat taxing to the individual.

From a public health standpoint, encouraging inactive persons to increase their physical activity is more important than encouraging already active persons to become even more active. Also, although people will probably benefit most from a lifelong practice of regular physical activity, it is never too late to begin. On the other hand, the benefits of physical activity do not persist if an active person becomes inactive; an athletic past alone will not protect a person from coronary heart disease (17).

To identify physically inactive and active people and to evaluate the effects of prevention policy measures, policy-makers should consider establishing large-scale, systematic surveillance systems for monitoring physical activity and related characteristics. Such systems are currently available only in a few industrialized countries, e.g., Australia, Canada, Finland, and the USA (23). Moreover, policy-makers should encourage the promotion of physical activity, ranging from the provision of facilities to changing the attitudes of schools, health care institutions, including public health agencies, businesses, communities, families, and individuals to reduce the prevalence of this important risk factor for coronary heart disease (22, 24).

References