

Physical Activity. An Efficient and Underused Way of Preventing Cardiovascular Disease From Childhood to Old Age

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In 1994, the World Health Organization recognized that a sedentary lifestyle was an independent risk factor for ischemic heart disease.¹ Persons with a sedentary lifestyle are estimated to have about twice the risk for ischemic heart disease, or of dying from it, as compared with active persons.¹ The regular practice of physical exercise has also been shown to be associated with a reduced risk for cerebrovascular disease.² Ischemic heart disease, together with cerebrovascular disease and other cardiovascular diseases, represent the largest cause of death in industrialized countries. Prevention of these diseases, therefore, is an important element in public health care programs in these countries. To this end, the encouragement of physical activity should form an important part in disease prevention and the promotion of health.

Physical Activity, Yes, But How Much? What Sort?, and How Often?

Although most of us agree that the promotion of physical activity is important, discussion remains about how much to do, what type of exercise is best, and how often to do it.³ Reasons accounting for this lack of agreement include variation in the methods used to measure physical activity in different studies, and that different indicators of health probably have a different pattern of association with physical activity⁴:

1. The type of dose-response association between the amount of physical activity and health has still not

been established (Figure). In the case of ischemic heart disease, it appears that small amounts of physical activity produce large benefits in health, and as the amount of physical activity increases the resulting benefit is gradually reduced (Figure, C).⁵ Beneficial effects on the heart are evident with an energy expenditure >1000 kcal/week; higher expenditures have a greater benefit, but of a lower magnitude. However, other health indicators, such as obesity or cancer, may have a different association with physical activity.

2. The type of physical activity can be defined by means of different criteria: according to the type of muscle contraction (dynamic-isotonic or static-isometric), or the type of metabolism employed to obtain the energy (aerobic or anaerobic). From the viewpoint of health, however, the most interesting type of physical activity depends on its intensity. For instance, does expending 1000 kcal walking (light-intensity physical activity) have the same effect on health as expending 1000 kcal running (vigorous-intensity physical activity)?³ This question still remains to be answered. Moderate physical activity (4-5.5 metabolic equivalents [MET]) and intense physical activity (6 MET) are accepted to have a beneficial effect on cardiovascular health, but no agreement exists concerning the effect of light physical activity (<4 MET), such as walking. Nevertheless, several studies have shown that for persons older than 65 years of age, walking is associated with a reduced risk for ischemic heart disease.⁶ Thus, at least in this subgroup of persons, which has the highest incidence of ischemic heart disease in the general population, data support the recommendation to walk, as an activity with a beneficial effect on the heart.⁶

3. Regarding the frequency of physical activity, most studies have analyzed the regular practice of physical activity divided into 3 or more sessions per week and studied its effects on health. However, it is becoming more and more common to find persons who do not normally undertake any physical activity during the week but who, at weekends, play a game of indoor soccer, or go for a bicycle ride with friends, either in the hills or on the road. As far as we are

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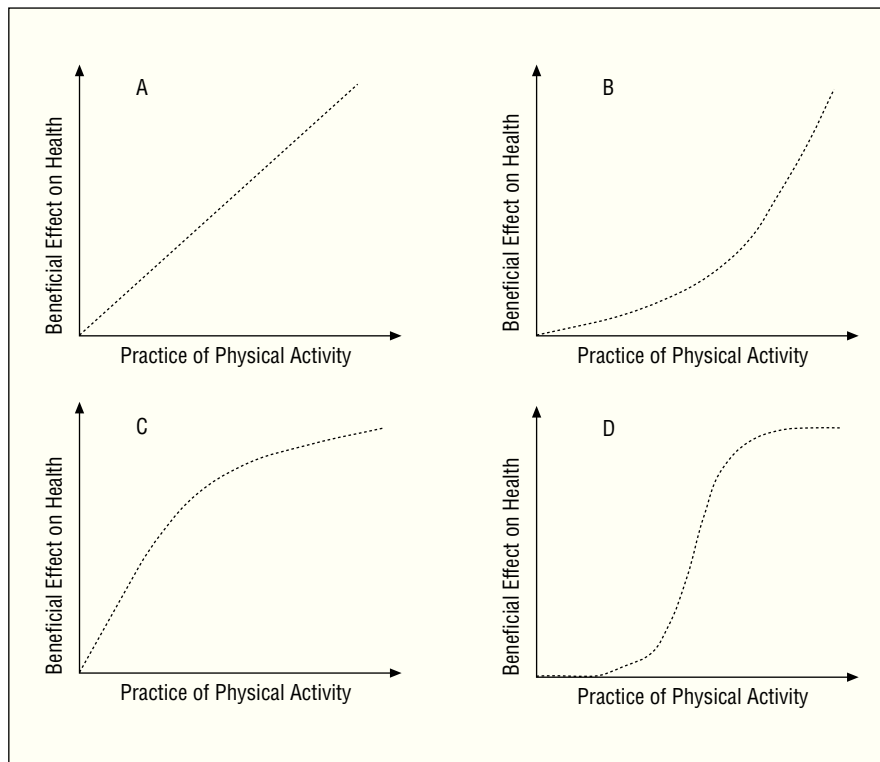


Figure. Representation of some of the possible kinds of dose-response association between the amount of physical activity undertaken and its effect on health.

aware, only one study has examined the effect of this once-a-week activity on health, concluding that in persons without risk factors this activity has beneficial results on mortality, but it has no benefit in persons with risk factors.⁷ It should also be recalled that during intense physical activity there is an increase in the risk of having an acute cardiovascular event (acute myocardial infarction, sudden death), especially in persons who do not regularly undertake physical activity.⁸ These data suggest that the wisest and recommended attitude is to undertake regular physical activity, at least three days per week, and, if possible, every day.

Physical Activity Versus Physical Fitness

In this issue of the *REVISTA ESPAÑOLA DE CARDIOLOGÍA*, Ortega et al⁹ present data on the level of physical fitness of Spanish adolescents, and establish reference values that can be used in both the health care and the educational setting.⁹ First and foremost, we should like to congratulate the authors on their effort, the quality of the study, and for its relevance and multidisciplinary approach. In their study, the authors provide normative values of the physical condition or fitness of Spanish adolescents, data that were previously lacking for our population, and show how this fitness can be evaluated by means of a set of standardized, valid, and objective tests (the EUROFIT battery).

At one point in the discussion, the authors state that increasing the level of physical activity is not sufficient, because the cardiovascular risk is related more with the level of physical fitness than with the particular physical activity undertaken. This statement requires qualification, since the debate about which is more important for health, physical activity or physical fitness, is controversial and still open.¹⁰ Physical fitness is closely associated with the practice of physical activity, such that persons who are more active are fitter, thereby hindering separate analysis of their independent effects. What is well established, however, is that, as with energy expenditure, intense physical activity is associated with improved physical fitness more than is moderate or light physical activity; i.e., expending 1000 kcal/week running results in a greater improvement in physical fitness than expending 1000 kcal/week walking. Thus, physical fitness mainly reflects the practice of intense physical activity; it is less influenced by moderate physical activity and even less so by light physical activity. There is no doubt that intense physical activity is associated with a lower rate of disease and death, but, as mentioned above, there are also signs that moderate and light physical activity are associated with beneficial effects on health.⁶ Physical fitness, therefore, is important, but light physical activity, even though it is not accompanied by important changes in physical fitness, is also relevant for improving health.

Recommendations About the Practice of Physical Activity

In December 1999, a European Working Group, which included the Spanish Heart Foundation, published certain recommendations in the European Union for the prevention of cardiovascular diseases by means of the practice of physical activity.⁵ These recommendations were summarized in the message that every European adult should accumulate 30 minutes of moderate-intensity physical activity, such as brisk walking, most days of the week and, if possible, every day. These recommendations agree with those for United States citizens, and equate to a weekly energy expenditure of about 1000 kcal. Greater energy expenditure is associated with greater benefit in cardiovascular health, but the magnitude of the benefit obtained is reduced (Figure, C).⁵ The European recommendations, however, include a special additional section aimed at children and adolescents, which establishes that this group of the population should undertake one hour of at least moderate physical activity daily.⁵ This recommendation, for children and adolescents, is very important for the following reasons:

1. The undertaking of physical activity at an early age has been shown to be associated with the practice of physical activity as an adult.¹¹ It is therefore important to encourage physical activity in young persons, so that when they become adults they remain active. Children and adolescents spend long hours at school each day and it is important that they undertake physical activity regularly at school. However, this is not solely the responsibility of the school. Public organisms, such as governments and city halls, should facilitate adolescents with access to areas where they can regularly play sports, as well as providing suitable installations and equipment. Parents also have their responsibility in encouraging, by example and stimulus, their children to exercise. Finally, each individual person, after being duly informed and with the means available, is also partly responsible when choosing a healthy lifestyle.

2. Studies have shown that young persons with a low level of physical fitness have a greater incidence of cardiovascular risk factors at follow-up,¹² and they probably also have a greater risk of future cardiovascular events.

Thanks to the researchers involved in the AVENA study, we now have available the normative values of physical fitness in a group of Spanish adolescents.⁹ These normative values will be very useful, in both the health care and educational settings, to provide an objective evaluation of the level of physical fitness of a particular adolescent, identify adolescents who have a

low level of physical fitness and intervene in this subgroup of persons in order to improve the level, thereby reducing any potential future cardiovascular risk. One possibility would be to set up this series of tests in Spanish schools, with the aim of determining the level of physical fitness of each student. These results could be very useful for the pediatrician or family doctor, who would then have valid and objective data for future use, just like normograms for weight and height, with a view to controlling the individuals' evolution and intervening by encouraging the practice of physical activity.

Practice, Promoting Physical Activity in the Spanish Population, and its Potential Impact on Health

One of the most important results of this study is that the level of physical fitness of Spanish adolescents is lower than that seen in other studies undertaken in nearby countries.⁹ The results also coincide with those of other studies concluding that Spanish adults undertake less physical activity than persons in other countries.⁵ These data, together with the increase in the prevalence of childhood obesity in Spain,¹³ should sound the alarm in political, health care, and educational leaders, as well as in families, with a view to improving the situation.

At a time when cardiovascular prevention depends increasingly on drugs,¹⁴ we should recognize the importance, efficacy and effectiveness of a healthy lifestyle in the prevention of cardiovascular diseases.¹⁵ We know that a sedentary lifestyle and adult obesity account for one third of premature deaths and almost 60% of cardiovascular deaths.¹⁵ In the United States, it has been calculated that the risk of ischemic heart disease attributable to a sedentary lifestyle is about 33% in the overall population; that is, if everybody in the United States was active, the number of coronary events in that country would fall by 33%.¹⁶ Furthermore, 80% of this reduction would be achieved if persons with a totally sedentary lifestyle did just a little physical activity.¹⁶

All these data concerning the benefits of physical activity, not only for cardiovascular health, but also for other indicators of health, should be made known to the general population. It is important that the whole Spanish population walk at least 30 minutes a day, every day of the week. To achieve this, those responsible for policies and health care should undertake national campaigns promoting physical activity,¹⁷ and health care professionals should recommend physical activity in their daily clinical practice.¹⁸ We now have physical fitness normograms for Spanish adolescents and these normograms can and must become important elements in promoting health in this group of persons, with one final aim: to increase the

practice of physical activity from childhood to old age, in order to improve the health of the Spanish population.

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