Increasing cardiorespiratory fitness as a prognostic intervention: why is it so underrated in clinical practice?

Aumento de la capacidad cardiorrespiratoria como intervención pronóstica: ¿por qué está tan infravalorada en la práctica clínica?

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Physical activity is widely recognized as a powerful clinical tool, enhancing quality of life and reducing mortality, also contributing to the treatment and/or prevention of several chronic diseases. Seventy years ago, the classical article by Morris *et al*.[1] showed a lower incidence of coronary heart disease in physically active workers, when compared with their inactive counterparts. In the following decades, epidemiological data from longitudinal prospective studies showed a significant reduction on general and cardiovascular mortality, associated with the weekly energy expenditure (volume of exercise)[2], with exercise intensity providing additional benefit[3].

Conversely, physical inactivity is considered by many authors a major public health concern, with huge epidemiological[4], and economical[5] consequences, what makes it comparable to a pandemic[6], with millions of premature deaths each year, and extra billions (whatever currency) spent yearly by the individuals themselves and in the public and private health systems.

In the last two decades, associations were established, between mortality and different measures of sedentary behavior and/or functional capacity. For instance, sitting time and TV/Screen time were associated with a higher mortality in several studies[7], which was attenuated or eliminated by regular physical activity[7]. In fact, screen time is a major concern in modern society, especially in adolescents, as it is associated with a sedentary lifestyle, with future health implications[8].

Measurements of functional capacity and mortality

Despite a huge amount of epidemiological data published mainly along 1970s and 1980s, only in this century Exercise capacity (EC) / Cardiorespiratory Fitness (CRF) began to be recognized as an important marker of longevity. In 2002, Myers *et al*.[9] studied 6,213 consecutive men referred for treadmill exercise testing for clinical reasons; these subjects were classified into two groups: 3,679 had an abnormal exercise test result or a history of cardiovascular disease; 2,534 had a normal test result and no previous history of cardiovascular disease. After adjustment for age, peak EC in METs was the strongest predictor for the risk of death, both in normal subjects and in those with cardiovascular disease. Each 1-MET increase in EC conferred a 12% improvement in survival.

In the following years, several important studies were published, showing similar results[10-12], showing an unequivocal relation between CRF and mortality. The strong evidence justified a scientific document from the American Heart Association in 2016[13], stating emphatically that the routine CRF assessment in the clinical setting was as important as a clinical vital sign to be taken: "There is, however, a large body of epidemiological and clinical evidence demonstrating not only that CRF is a potentially stronger predictor of mortality than established risk factors such as smoking, hypertension, high cholesterol, and type 2 diabetes mellitus, but that the addition of CRF to traditional risk factors significantly improves the reclassification of risk for adverse outcomes."

Another Editorial, published eight years ago in Archivos de Medicina del Deporte wondered why physical activity was so undervalued in the reduction of cardiovascular risk, despite of the existing evidence[14].

In fact, CRF improvements are associated with better outcomes in nonfatal cardiovascular events[15], with a 8% reduced risk of developing hypertension for each 1-MET improvement in CRF[16], a reduced risk of developing permanent atrial fibrillation (AF)[17], a better outcome in hypertensive patients with AF[18], a lower risk of developing heart failure[19], a reduced risk of fatal and nonfatal stroke[20], a reduced risk of cardiovascular events in subjects with hyperlipidemia[21], reducing long-term mortality[22].

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A study by Kokkinos *et al*.[23] showed a reduction of 14% in mortality for each 1-MET increase in a cohort of 750,302 subjects. The benefits occurred independent of gender, ethnic group (White, African-American, Hispanic, Native-American), or age (including septuagenarians and octogenarians). The same author, considering that most studies analyzed only one assessment of CRF, studied the prognostic impact of changes in CRF in two distinct evaluations, separated by at least one year, in 93,606 participants. A decrease of 2,0 METs represented 74% increase in risk for low-fit individuals with cardiovascular disease, and 69% increase in risk for those without CVD. In the whole cohort, inverse and proportionate changes in mortality risk, regardless of previous CRF status were clearly observed[24].

As a cardiologist, it is my routine to rigorously observe and pursue clinical goals in my patients, including those with high and very-high cardiovascular risk. It includes LDL-cholesterol goals, HbA1c goals for those who also have diabetes, blood pressure goals, always with the objective of reducing cardiovascular risk, and improving prognosis. Also, recommendations for quitting smoking, reducing body fat percentage, and having better eating habits are often made.

Therefore, I ask you: why aren't we so strong in routinely evaluating CRF in our patients, and in recommending and prescribing physical exercises, a powerful intervention which is known to promote a series of physiological adaptations and clinical improvements, which will ultimately reduce cardiovascular risk? More than seventy years after the pivotal study by Morris, there is certainly enough scientific evidence to justify individualized physical exercise recommendations, not only to all of our patients, but instead to every single person in the world!

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