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Letter to the Editor · **Open Access** ·

Changes in physical activity and cardiovascular mortality in older adults

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To the Editor

Cardiovascular disease (CVD) is the main cause of death in older adults.[1] There is strong evidence that regular physical activity (PA) reduces the risk of CVD mortality in this population group.[2-4] However, these studies used baseline data and do not account for potential changes in PA. Previous research on the mortality effect of changes in PA focused on all-cause deaths;[5] hence, this is the first study aimed to examine the association of changes in PA with subsequent CVD mortality in older adults.

We used data from the UAM cohort, which was established in 2000/2001 with 4008 individuals representative of the non institutionalized population of Spain aged ≥ 60 years.[5] In 2003, an attempt was made to contact the subjects again, with success in 3235 cases.[5] PA was evaluated at baseline and at 2003 with a single question from the Spanish National Health Survey. Participants rated their leisure time PA level as (1) inactive, (2) occasional, (3) several times a month, and (4) several times a week.[6] Four groups of change in PA were established: continually inactive, decreased PA, increased PA, and continually active.[5] The outcome variable for the present study was CVD mortality from 2003 to 31 December 2014. Mortality data were obtained by linkage with the Spanish National Institute of Statistics database on vital status and cause of death.

Cox regression was used to evaluate associations between changes in PA and CVD mortality. Two models with progressive adjustment for potential confounders were built. Model 1 was adjusted for sex and age, and model 2 was further adjusted for educational attainment, smoking status, alcohol consumption, subjective health, Mini-Mental State examination, body mass index, systolic blood pressure, hypercholesterolemia, agility disability, mobility disability, limitation in instrumental activities of daily living, and the following self-reported diseases diagnosed by the physician: asthma/bronchitis, coronary heart disease, stroke, diabetes, depression, hip fracture, and cancer. The statistical analysis was performed in 2017.

The present analysis was conducted with 2836 individuals aged 71.3 ± 7.62 years (56.7% women) with complete information on PA changes, mortality and covariates. The percentage of individuals who remained inactive, increased PA, decreased PA, and remained active during follow-up was 16.7%, 9.7%, 25.7% and 47.9%, respectively.

During a mean follow-up time of 9.1 ± 3.6 years, we identified 467 CVD deaths. Compared to being continuously inactive, after adjusting for potential confounders, those who increased PA had a 25% (95% CI: 1%–43%) lower CVD mortality, and those who remained active had a 58% (95% CI: 42%–69%) reduced mortality. The decrease CVD mortality risk in participants who increased PA and remained active *vs*. those who were continually inactive was equivalent to a reduction of two and seven years in chronological age, respectively. Decreased PA, however, showed a similar CVD death risk than being continuously inactive (HR: 0.96, 95% CI: 0.68–1.34). Figure 1 shows that differences in CVD mortality between continually inactive and continually active participants appeared from the first year of follow-up, whereas mortality differences between continually inactive participants and those who increased PA were observed later.

The results did not change when stratified by sex, age and educational attainment (all *P* for interaction > 0.1).

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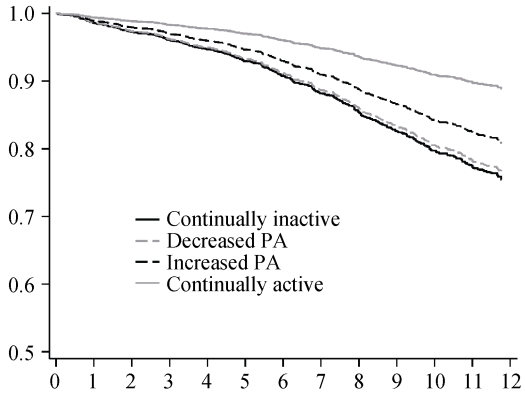

Figure 1. Cumulative survival according to changes in PA in older adults (*n* = 2836). Analyses were adjusted for sex, age, socioeconomic status, smoking status, alcohol consumption, subjective health, Mini-Mental State examination score, body mass index, systolic blood pressure, hypercholesterolemia, agility disability, mobility disability, limitation in instrumental activities of daily living, asthma/bronchitis, coronary heart disease, stroke, diabetes depression, hip fracture, and cancer at any site. PA: physical activity.

However, the number of chronic conditions modified the study association (*P* for interaction < 0.001), which suggests that increasing PA or being continually active might offer lower protection against CVD deaths among older adults with worse health. Specifically, compared with continually inactive individuals, those who increased PA and remained active had similar CVD mortality risk in older adults with two or more chronic conditions (HR: 1.02, 95% CI: 0.65–1.62, and HR: 0.77, 95% CI: 0.47–1.28, respectively), but both conditions were protective among participants with none (HR: 0.54, 95% CI: 0.32–0.91, and HR: 0.32, 95% CI: 0.19–0.57, respectively) or one chronic disease (HR: 0.62, 95% CI: 0.39–0.97 and HR: 0.26, 95% CI: 0.16–0.43, respectively).

These results showed that those older adults who increased or maintained PA levels had lower CVD mortality, but the benefits appeared before among those who remained active. In addition, the beneficial effect of maintaining and increasing PA was greater among those who have better health. These findings highlight the importance of public health strategies to promote PA in older adults, as allowed by their abilities and health conditions.[7] Since PA was self-reported, these findings should be confirmed with objective measurements (e.g., accelerometers) in future research studies.

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