Association leisure time physical activity with risk of primary cardiac arrest in the general population: a nationwide cohort study of the dose-response relationship

Moo-Nyun Jin  
Pil-Sung Yang  
Hee Tae Yu  
Tae-Hoon Kim  
Jae-Sun Uhm  
Jung-Hoon Sung  
Hui-Nam Pak  
Moon-Hyoung Lee  
Boyoung Joung

**Introduction**: It is widely accepted that leisure time physical activity is associated with a reduced risk of mortality. However, high-intensity activity may transiently increase the risk of primary cardiac arrest (PCA). It is an important question from the public health perspective whether leisure time physical activity confers overall protection from PCA.

**Methods**: In this nationwide sample cohort study, 506,805 individuals (mean age, 47.8±14.4 years; 252,153 women [49.8%]) participated in the Korean National Health Screening Program. On the basis of level of leisure time physical activity (LTPA) indicated in a standardized self-reported questionnaire at baseline, we evaluated the effect of LTPA at different energy expenditures on the PCA.

**Result**: During a median follow-up of 4 years, 799 PCA events were occurred, and the incidence of PCA was 41.1 events per 100,000 person-year. Compared with inactive individuals, those who met the minimum recommended physical activity level (7.5-15.0 metabolic equivalent hours per week) had a 36% lower risk of PCA (HR 0.64 [95% CI, 0.53-0.77]) and those who reported 2 to 3 times the recommended LTPA had the maximum benefit for reduced risk of PCA (HR 0.58 [95% CI, 0.44-0.76]). The continued benefits were observed up to 5 times the minimum recommended LTPA. In addition, there was no evidence of increased risk of PCA when more than 5 times the minimum recommended level (HR 0.74 [95% CI, 0.50-1.093]). These associations were consistent regardless of age, sex, BMI and across categories of Framingham risk score.

**Conclusion**: The beneficial effect of LTPA on PCA started at a low dose and meeting the public health guidelines recommended minimum physical activity was associated with nearly the maximum risk reduction of PCA. The largest benefit occurred at 2 to 3 times the minimum recommended LTPA. Highly active level of up to 5 times the minimum recommended LTPA continued to have benefit against PCA and no excess risk at 5 or more times the recommended. In regard to PCA, health professionals should encourage inactive adults to perform LTPA and do not need to discourage adults who already participate in high level of LTPA.