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Letters

RESEARCH LETTER

Impact of Physical Activity on Clinical Outcomes in AF Patients Undergoing Catheter Ablation

Current guidelines recommend that the optimal management of atrial fibrillation (AF) requires a holistic approach that includes lifestyle modification.[1,2] Maintaining regular physical activity (PA) is a major component of lifestyle modification, but its optimal dose for AF patients remains a topic of debate. Although regular PA has been shown to have a beneficial effect on cardiovascular health in general, vigorous or endurance PA may promote AF or recurrence.[3] Thus, recommendations for optimal PA remain uncertain for patients with successful atrial fibrillation catheter ablation (AFCA). The present study aimed to investigate the impact of PA on clinical outcomes among patients undergoing AFCA.

This was a retrospective cohort study that utilized health checkup data from 2009 to 2016 available at the National Health Insurance Service in the Republic of Korea. The study was approved by the Institutional Review Board of the Seoul National University Hospital (No. E-2007-138-1143) and adhered to the 2013 revised Declaration of Helsinki.

This study investigated patients who received AFCA and underwent a health checkup within 2 years after the procedure from the population diagnosed with AF between 2009 and 2020. The study population was divided according to PA status and doses. The no PA group comprised patients who reported not performing any PA in the past week on the health habit survey, while the PA group comprised the remaining patients. Also, the study population was recategorized into no PA and mild, moderate, and vigorous PA groups (corresponding to the patients with PA doses of 0, 1-499, 500-1,499, and ≥1,500 MET-min/week, respectively).

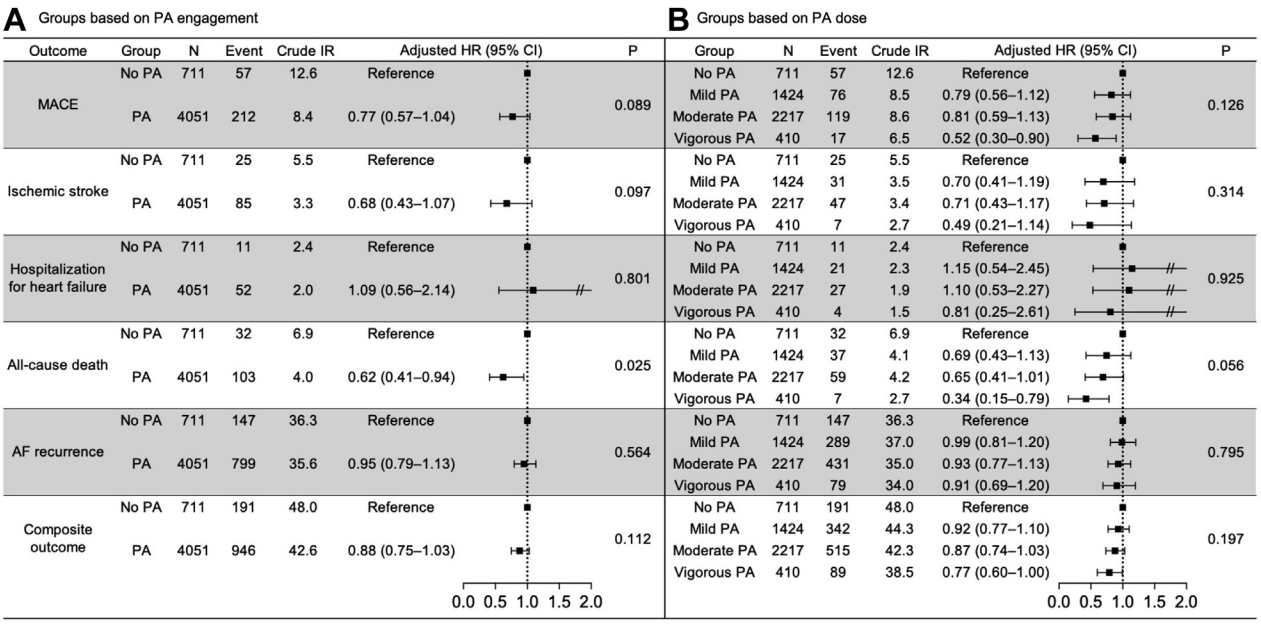
The primary outcome of this study was the occurrence of major adverse cardiovascular events (MACE) and the secondary outcomes were each component of the primary outcome. As an exploratory outcome, AF recurrence after the index AFCA was defined as utilizing redo AFCA or direct-current cardioversion during follow-up. The risks of study outcomes were evaluated using adjusted HRs (aHRs) with 95% CIs through multivariate Cox regression analysis.

Among patients undergoing AFCA, a total of 711 and 4,051 patients were identified as the no PA and PA groups, respectively. Compared with the no PA group, the PA group tended to be associated with a lower risk of MACE (aHR: 0.77; 95% CI: 0.57-1.04; $P = 0.089$), but this was statistically nonsignificant (**Figure 1**). For the secondary outcomes, the PA group was associated with a significantly lower risk of all-cause death (aHR: 0.62; 95% CI: 0.41-0.94; $P = 0.025$) (**Figure 1**).

Regarding PA doses, higher doses showed a statistically non-significant trend towards a greater reduction in the risk of MACE (aHR for MACE: 0.79 [95% CI: 0.56-1.12], 0.81 [95% CI: 0.59-1.13], and 0.52 [95% CI: 0.30-0.90] for the mild, moderate, and vigorous PA groups, respectively; P for trend = 0.126), (**Figure 1**). For the secondary outcomes, there was also a trend for a dose-response relationship between PA and all-cause death, with lowering risks of all-cause death with higher PA doses (aHR: 0.69 [95% CI: 0.44-1.13], 0.65 [95% CI: 0.41-1.01], and 0.34 [95% CI: 0.15-0.79] for the mild, moderate, and vigorous PA groups, respectively; P for trend = 0.056) (**Figure 1**).

Although this study may have several limitations, to the best of our knowledge, this is the largest observational study showing the mortality benefit of PA in patients underwent AFCA. From the results, we concluded that maintaining regular PA after AFCA was associated with a lower risk of all-cause death without any higher risks of other cardiovascular adverse events and AF recurrence. The study may support the role of regular PA as a part of integrated care management for AF patients undergoing catheter ablation.

FIGURE 1 Comparison of Clinical Outcomes After AF Catheter Ablation According to PA Status



(A) Analysis based on PA engagement. (B) Analysis based on PA doses. AF = atrial fibrillation; CI = confidence interval; HR = hazard ratio; IR = incidence rate in 1000 person-years; PA = physical activity; MACE = major adverse cardiovascular event(s).

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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