Habitual exercise provides better prognosis for cardiac arrest with coronary artery disease

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Background: Although regular physical activity has beneficial cardiovascular effects, exercise can trigger sudden cardiac arrest (SCA). Coronary artery disease (CAD) was identified as the most common cause of an exercise-related out-of-hospital cardiac arrest (OHCA). Regular exercise has been reported to reduce the risk of plaque rupture in animal studies and basic research. Therefore, we compared the coronary artery findings in CAD-OHCA patients with and without habitual exercise.

There have been few reports on whether regular exercise changes the prognosis in OHCA due to CAD (CAD-OHCA). We investigated the association between the better clinical outcome and the regular exercise in patients with CAD-OHCA.

Methods: This is a single-center retrospective analysis from 2006 to 2019. The consecutive 397 patients with OHCA due to myocardial ischemia underwent coronary angiography (CAG). After excluding 73 patients with vasospastic angina, the remaining 324 patients with CAD were enrolled in this study. We divided these patients into two groups according to whether they were habitually exercising (Exercise group: N=37) or not/unknown (Non-Exercise group: N=287).

Clinical outcome was a 30-day survival with minimal neurologic impairment represented by a Glasgow-Pittsburgh Cerebral Performance Categories Scale value 1 or 2.

Results: The patients in the Exercise Group were significantly younger (exercise vs. non-exercise, 57±12 vs. 64±12 years; P<0.01) than those in the non-exercise group. The Exercise group had a lower incidence of diabetes mellitus (22% vs. 42%; P=0.02) and a higher incidence of dyslipidemia (81% vs. 62%; P=0.02) than the non-exercise group. The time from collapse to cardiopulmonary resuscitation (1.4±4.0 vs. 3.0±4.8min) and from collapse to return of spontaneous circulation (11.9±10.0 vs. 28.0±25.3min) were shorter in Exercise group (all p<0.05). The ST-segment elevation was recorded on electrocardiography in fewer of the Exercise group (22% vs. 63%; P<0.01). The finding of culprit lesion in the coronary arteries on arrival resulted significant differences between the 2groups (good collateral and/or TIMI3 flow: 62% vs. 25%, the plaque rupture and/or thrombus: 22% vs. 73%) (all p<0.01) (Figure 1). Kaplan-Meier curve showed Exercise group has better neurological outcome at 30days compared than Non-Exercise (95% vs 51%; P<0.001, log-rank test) (Figure 2). Multivariable Cox proportional hazards models revealed that a habitual exercise was one of the predictors of a good neurological outcome (HR 0.21, 95% CI 0.05–0.92; P=0.039).

Conclusions: The patients with habitual exercise had less plaque rupture, less coronary thrombosis than non-exercise. The patients with regular exercise had better clinical outcomes than non-exercise after CAD-OHCA.

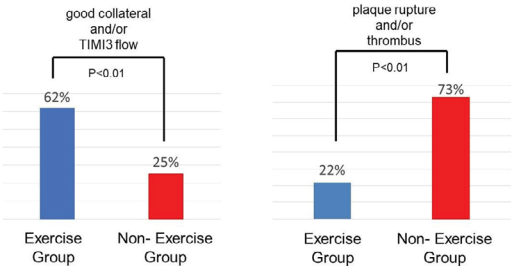

Figure 1. Findings of the culprit lesion in coronar arteries

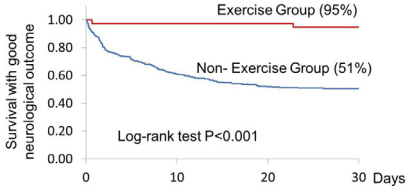

Figure 2. Kaplan-Meier analysis