4951

Long-term prognostic value of adherence to leisure time physical activity prescription in patients undergoing exercise-based cardiac rehabilitation: an inverse dose-response relationship

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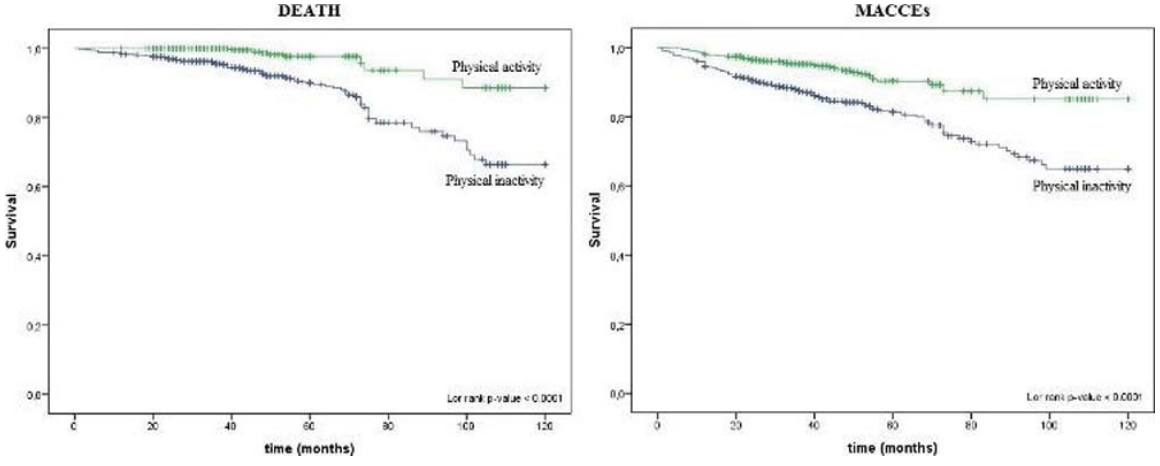
Background: The benefits associated with leisure time physical activity (LTPA) in primary and secondary cardiovascular prevention has been known for decades. Although several studies demonstrated that exercise-based cardiac rehabilitation (CR) programs reduce mortality, the long-term prognostic value of adherence to LTPA presciption after exercise-based CR has not been well estrablished.

Purpose: Evaluate the long-term prognostic value of adherence to LTPA presciption after exercise-based CR in patients undergoing myocardial revascularization and/or cardiac valve surgery.

Methods: A prospective registry of 2.340 consecutive patients, admitted to the Cardiovascular Prevention and Rehabilitation Unit was created. All patients completed a standard in-hospital CR program. Data regarding LTPA and outcomes were collected. End points were: overall and cardiovascular (CV) mortality and major adverse cardiovascular and cerebrovascular events (MACCEs). The population has been classified into: 1) Physical inactivity: almost completely sedentary or occasional physical activity; 2) Physical activity: regular aerobic LTPA. The amount of LTPA was further collected according to minutes per week.

Results: A total of 1.892 patients with available data on LTPA and outcomes were included in the study; mean follow-up was 50±23 months. One-thousand and twenty-two (54%) patients underwent myocardial revascularization (CABG), 662 (35%) cardiac valve surgery, 208 (11%) combined valve and CABG surgery. Adherence to a regular LTPA was found in the 42% (792 participants) of the population, while 58% (1.100 patients) reported occasional LTPA or a complete physical inactivity. Kaplan-Meier survival curve showed a lower overall mortality ($p<0.0001$), CV mortality ($p<0.0001$), and MACCEs ($p<0.0001$) in LTPA group (figure). After adjustment for age, gender, arterial hypertension, diabetes, type of intervention, glomerular filtration rate and left ventricular ejection fraction, both overall and CV mortality were significantly lower in the LTPA groups (OR=0.24; $p<0.0001$ and OR=0.35; $p<0.046$, respectively), as well as combined MACCEs (OR=0.36; $p<0.0001$). Moreover, an inverse relationship between the increase of minutes per week of LTPA and the decrease of overall (HR 0.990; $p<0.0001$), CV mortality (HR 0.991; $p<0.0001$) and MACCEs (HR 0.996; $p<0.0001$) was found, with 1% reduction of relative risk of events for each minute per week increase of physical activity. Finally, comparing LTPA to standard medical therapy in our population, LTPA showed the lowest number needed to treat (NNT) to save a life (NTT=12).

Conclusion: Adherence to leisure time physical activity prescription is independently associated with significant reduction of overall mortality, CV mortality and MACCEs on top of exercise-based CR program after myocardial revascularization and/or cardiac valve surgery.



Central figure