How does regular physical exercise protect against sudden cardiac death?

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A group of researchers from the departments of Physical Therapy, Medicine and Electronic Engineering of Valencia University and from the innovations group ITACA have published research into physical exercise as a protector against sudden cardiac death. The study has been

published in *PLoS One*.

The team includes Luis Such-Miquel, Laia Brines, Antonio M. Alberola, Mauel Zarzoso, Francisco J. Chorro, Juan Guerrero, Germán Parra, Nathalia Gallego, Carlos Soler and Irene Del Canto. Specialists of the Incliva and the Polytechnic University of Valencia also participated.

Moderate aerobic physical exercise protects against sudden cardiac death , which in a majority of cases is caused by the deadliest type of arrhythmia: ventricular fibrillation. In fact, aerobic physical exercise has been suggested as a non-pharmacological treatment against arrhythmias.

However, the exact underlying cardiovascular protection mechanisms are not fully understood. This research sought to determine if an aerobic physical exercise protocol in sedentary animals, such as lab rabbits, could exert a beneficial effect on the electrical properties of the heart related to ventricular fibrillation. Furthermore, they attempted to learn whether cholinergic neurons in the heart play a role in the potential modifications caused by moderate training.

The researchers studied the intrinsic electrophysiological heterogeneity and modifications to electrical stability on an isolated rabbit heart, which has been the subject of the study of the effects of prolonged physical exercise on cardiac electrical properties, as well as the consequences on these properties, which includes blocking the action of cholinergic neurons on the cardiac cells.

After conducting the experiments and analysing the results, they observed that in the isolated and perfused rabbit heart, training via a protocol of physical exercise produced increased ventricular refractoriness, a decrease of ventricular electrophysiological heterogeneity, and an increase of electrical stability. These properties were modified in a beneficial way by the applied physical exercise

protocol. This clarifies the basic mechanisms through which regular physical exercise exerts a protective effect against sudden cardiac death, as well as providing information on the participation of cholinergic cardiac neurons on such modifications.

The researchers suggest continuing with this line of research in order to clarify the underlying mechanisms of the observed modifications.

More information: Luis Such-Miquel et al. Effect of chronic exercise on myocardial electrophysiological heterogeneity and stability. Role of intrinsic cholinergic neurons: A study in the isolated rabbit heart, *PLOS ONE* (2018). DOI: 10.1371/journal.pone.0209085

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