International Journal of Cardiovascular Sciences. 2018;31(6)558-559

EDITORIAL

Digital Tools and Cardiovascular Rehabilitation

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Cardiovascular diseases are the leading cause of death worldwide. The inclusion of patients with such diseases in cardiovascular rehabilitation (CR) programs is an evidence-based conduct, since it has the potential to improve the individual's clinical condition and manage several risk factors associated with these diseases.[1] The association of aerobic and resistance exercises is a recommended combination in many CR programs. However, technological tools have been studied and used in order to increase the range of methods to optimize the results in the scenario of secondary prevention of cardiac diseases. In addition, combining modern strategies and conventional models can be a form of motivation for the patient by making CR interactive and funnier. In this case, virtual reality (VR) has also been used, including in our country.[2,3]

A study published by Silva et al.[4] in this issue of the International Journal of Cardiovascular Sciences compares the effects of conventional rehabilitation with VR on body composition and functional capacity of patients with cardiac diseases. It is a randomized controlled trial (RCT) in which 27 patients with cardiac diseases were enrolled to participate in an eight-week CR program. The sample was divided into two groups: a) conventional rehabilitation; b) rehabilitation with VR. The sessions lasted 60 minutes for both groups and the weekly frequency was twice a week. Conventional rehabilitation consisted of two parts: 25 minutes of aerobic exercise followed by 25 minutes of exercises with weights (upper and lower limbs). The intensity control during aerobic exercise was performed by monitoring the heart rate reserve determined by the Karvonen equation (50% and 80%). For resistance exercises, intensity was controlled by rating of perceived exertion (up to 13 on the Borg scale). Rehabilitation with VR was performed using Microsoft's Xbox 360 with Kinect. The twenty-five minutes of games consisted of exercises for the upper and lower limbs and 25 minutes of dancing with the Dance Central 3 game. In the first part, velcro weights were used in the ankle and dumbbells in the hands for the resistance exercises. The intensity was only controlled in the first part of the activity. Functional capacity was measured through a 6-minute walk test, which significantly increased in both groups. Similarly, both groups had the capillary blood glucose reduced. However, as opposed to what was expected, none of the two strategies significantly reduced fat percentage and body weight. In fact, the VR group presented a significant increase in these two variables compared to the conventional rehabilitation group.

The research question studied seems relevant and original and the results contribute to the knowledge on RC. However, this is an experiment with many limitations, some of which have been reported by the authors themselves. The sample size was small and the intervention period may not have been sufficient to promote positive results in the participants' body composition.[5,6] The absence of a proper nutritional assessment may have directly influenced the results on body composition.[7] In addition, it would be recommended to control exercise intensity and volume in order to quantify the isocaloric protocols for both groups. Therefore, the researchers did not control such measure and, because of this, each exercise protocol may have promoted unequal energy expenditures. Besides, controlling the heart rate of the VR group would have been important to respect the same training zones as the group exposed

Keywords

Cardiovascular Diseases/physiopathology; Virtual Reality; Cardiac Rehabilitation; Exercise Movement Techniques/methods; Quality of Life.

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DOI: 10.5935/2359-4802.20180082

Manuscript received July 18, 2018; revised manuscript July 25, 2018; accepted July 25, 2018.

to conventional rehabilitation.[8] Another strategy to control exercise intensity would be to quantify METS in the rehabilitation sessions. It should also be noted that the increase in fat percentage and fat weight may be related to the absence of nutritional counseling (food control was only performed through a reminder). Through nutritional counseling, the individuals participating in the experiment would have received proper guidance so they could change their eating habits rather than simply record their food intake.[9]

Despite some major biases and limitations, we believe the study has some merits. In a nutshell, the researchers entered in a field that mixes the present with the future, by showing in this RCT the effectiveness that a strategy of rehabilitation through VR has the potential of inducing similar gains to conventional CR on variables such as functional capacity and capillary blood glucose. In this regard, functional capacity is a powerful measure and is directly related to death by cardiovascular outcomes.[10] Improving the functional capacity of individuals with heart diseases can qualify the protocol that uses VR as a tool to be used in CR. Now, it is evident that studies with a more robust sample size, longer intervention period and with well-structured protocols are necessary to answer some questions about the real role of VR in the CR scenario.

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