

Remote Cardiovascular Rehabilitation at COVID-19 Times: Experience in a University Hospital

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Abstract

Multiple studies have shown that cardiovascular rehabilitation (CVR) programs are safe and effective in improving functional capacity and quality of life, as well as reducing readmission and all-cause mortality. Unfortunately, CVR programs are significantly underutilized, with 20-30% of eligible patients participating, with even fewer women, older adults, and individuals from underserved populations. Our study was designed to determine the feasibility of remote CVR in our patient population and to point to improvements in functional and quality-of-life endpoints after a 12-week hybrid period of multicomponent team intervention. COVID-19 is added to the already known barriers of CVR. As seen in our recent experience, remote rehabilitation is undoubtedly an alternative that we should explore. We consider highly relevant the configuration of a multi-component team, and the incorporation of psychosocial support (mental health) into the rehabilitation team to optimize the social role of the participants. Remote CVR is a viable alternative, as it has not only improved the quality of life for patients during the pandemic but also overcomes barriers such as travel and social problems, which often impede patient care. Without a doubt, there is no better time than now to explore and implement methodologies that improve or complement existing CVR programs.

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Introduction

Multiple studies have shown that cardiovascular rehabilitation (RCV) programs are safe and effective in improving functional capacity and quality of life, as well as reducing re-internation and mortality by all causes. The first step of secondary prevention is multidisciplinary RCV, which aims to reverse the physiological and psychological effects of cardiovascular disease, obtain clinical stabilization (which leads to significant reductions in hospitalizations, cardiovascular events and premature death), Optimize cardiovascular risk and improve the psychosocial and vocational state of participants [1-3]. In this sense, guides recommend that RCV contemplate patient education, and emphasize healthy behaviors and training with exercises (IA recommendation) [4,5].

Unfortunately, RCV programs are considerably underutilized, and between 20-30% of eligible patients participate, being even lower in women, older adults and individuals of unattended populations. (6-8) barriers or factors that hinder the RCV include the lack of derivation and resources, logistics and psychological problems. The development

of new technologies provides the opportunity to include telemedicine in the organization of outpatient care [5,9, and 10].

From the preventive and mandatory social isolation by COVID-19, the question of how to continue cardiovascular rehabilitation programs was raised [11]. Although most centers lack experience in operating at a distance, this alternative also known as TV -Rehabilitation has taken relevance in the last year in our country. Distance rehabilitation could be adopted for selected patient groups, in which it demonstrated adherence and safety, and would also solve the aforementioned barriers allowing more patients to benefit. On the other hand, the availability (quotas) of the rehabilitation center would increase to incorporate a greater number of patients.

Our study was designed to determine the feasibility of remote RCV in our patient population, and point out the improvements in functional and quality of life after a hybrid period of 12 weeks of intervention of a multi-component team.

Materials and Methods

A descriptive and comparative study of the cross-section was



conducted. Patients who were referred to the cardiology division were included to initiate cardiovascular and/or respiratory rehabilitation between November and February 2021. The multi-component team was formed by a cardiologist, a kinesiologist specializing in RCV, and a resident of the Bachelor of Nutrition, in addition to permanent contact with different areas, such as sleep disorders, smoking, sexuality, heart failure and pulmonary hypertension. A structured intervention was carried out with regular patient monitoring, which included face-to-face visits at the beginning, half, and end of the rehabilitation plan. The telephone and a WhatsApp group for distance assistance were used. Basal characteristics, ergometric and echocardiographic variables, fragility evaluation (Edmonton test) and quality of life (SF-36 questionnaire), which were compared after three months of distance rehabilitation were described.

The categorical variables were expressed as absolute values and percentages, and the continuous variables, with average and standard deviation (of), assumed normal distributions. For the statistical comparison of the discrete variables, the Chi2 test and Student T test for continuous variables were used. A value of $p < 0.05$ was considered significant. Stata 11.1 software was used. All patients gave informed consent to rehabilitate remotely.

Results

19 patients of 23 derivatives were included during Covid-19 isolation. The average age was 64.89 years (12,32) and 68.42% were male. Basal characteristics can be observed in the table 1, patients were admitted by syncopal repetition episode (one), cell phone lack and incomplete revascularization (two).

The coronary disease was the main reason for derivation (63.16%), followed by combined posoperative (revascularization surgery + valvular replacement 10.53%). 78.95% received aspirin (31.58% double anti -region), 89.47% beta blockers and statins.

The functional capacity increased (Basal 5.92 Mets vs. 3 months 6.72 Mets, $p < 0.01$) as well as the ejection fraction (38.50% vs. 44.25%,

Table 1: Basal characteristics of patients in remote rehabilitation.

Education	Basic	50.00
	Advanced	33.33
	Universitary	16.67
Occupation	Active	38.46
	Retired	53.85
	Housekeeping	7.69
Marital status	Married	50.00
	Single	41.67
	Divorced	8.33
Location	City	58.82
	Periperial	41.18
Coberture	National health program	61.54
	Other	15.38
	Not	23.08
Risk factors	Arterial hypertension	42.11
	Dyslipidemia	36.84
	Smoking	10.53
	Ex-Tabaquismo	52.63
	Diabetes	36.84
	Hereditary history	15.79
	Obesity	10.53
	COPD	10.53
	MCP/CDI	10.53

$p = 0.05$). There was a decrease in LDL cholesterol figures (Basal Media 96.52 vs. 3 months 78.60 mg/dl). A decrease in fragility parameters (Figure 1) was observed; 58% of patients referred to sadness or depression. Finally, the dimensions of the quality-of-life test were improved (predominance of physical functioning 61 vs. 68, $p = 0.08$) after the rehabilitation period (basal average 47.66 vs. 3 months 55.45, $p = 0.05$), except the dimension corresponding to the social role that worsened for the basal record, but without reaching a statistically significant difference (Basal 57.50 vs. 3 months 45.00, $p = 0.90$).

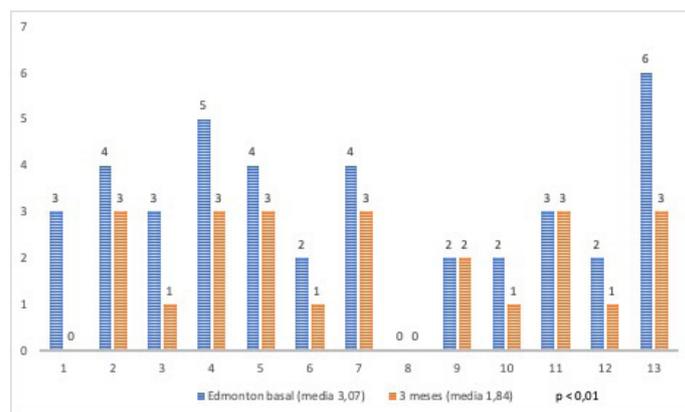


Figure 1: Comparison of fragility parameters (Edmonton test).

Discussion

At a time when conventional programs were forced to close, some have considered the opportunity to carry out a transition (or expansion) towards digital health formats, which provides a safe solution for patients, families and health personnel in the middle of COVID-19. In this way, it allows for the provision of care while maintaining physical distance, which reduces disease transmission and keeps vulnerable heart patients safe and essential [12].

The implementation of home or distance programs, designed for low -to moderate risk patients, could achieve better access to RCV, increase participation and, therefore, adhesion.

In this sense, it is suggested that each center develop the most appropriate model for its particular situation [13,14]. In this way, some of the many barriers that arise when considering the RCV as a treatment option (high cost of the sessions in terms of human resources and equipment, transfer, incompatibility of schedules, economic restrictions of economic restrictions are disintegrated Participants, long waiting lists, need to be assisted by relatives or couples, lack of motivation, low health literacy) [15-17]. RCV training also has an important role, both for patients and doctors. The inclusion of fundamentals of RCV in the training program of internists and cardiologists could dissipate the lack of recognition of the benefit generated by the RCV and will collaborate to incorporate it as a fundamental part of the spectrum of the treatment of cardiovascular diseases.

The first meta-analysis on RCV based on Tele-Salud exercises was published in 2016. The main findings of the 11 randomized trials included were that the TV-Salud RCV seemed to be at least so effective and, in some cases, more effective to optimize cardiovascular risk factors, physical activity levels, diastolic blood pressure, cholesterol and functional capacity [18].

The findings of our experience are consistent with the meta-analysis of Rawstorn JC, et al. (2016) [18], and with the Cochrane reviews that



showed that home RCV programs are as effective as center-based programs, either short (3 to 12 months) or in the longer term, to impact in the number of heart events, functional capacity, modifiable risk factors or health-related quality of life. In addition, the home RCV showed higher levels of adherence to the program [9].

Similarly, our results also coincide with other reviews that compared “telerehabilitation” with other RCV benefit models in patients with cardiopulmonary diseases [19,20]. Although in the RCV section of the Clinicas Hospital we have incorporated Virtual visits to nutrition and kinesiology, real-time training monitoring with devices is, for the moment, a little accessible reality in our environment [21,22].

As recommended by the American Cardiovascular and Pulmonary Rehabilitation Association, all patients were included under an initial evaluation and received an individualized treatment plan, which consisted of nutritional education, advice on weight, control of cardiovascular risk factors, abandonment of tobacco and physical exercise.

We hope that the publication of the results of our work will establish new remote RCV programs, which contribute to reducing the asymmetry in the geographical distribution. We have considered the low N study as a limitation because it represents the first stage of social, preventive and mandatory isolation, and therefore, some data must be taken with caution.

Conclusions

To the known barriers of the RCV, COVID-19 is added. As seen in our recent experience, distance rehabilitation is undoubtedly an alternative that we must explore. We consider the configuration of a multi-component team very relevant, and the incorporation of psychosocial (mental health) to the rehabilitation team to optimize the social role of the participants.

Distance RCV is a viable alternative since it not only improved the quality of life of patients during a pandemic but also puts barriers such as transfer and social problems, which often prevent patient assistance.

Undoubtedly, there is no better time than the current one to explore and implement methodologies that improve or complement existing RCV programs.

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