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Hypertension, Exercises, Physical Therapy and Type 2 Diabetes Mellitus Elderly

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ABSTRACT

Objective: As the cardiovascular disease produced by the association of the hypertension and type 2 diabetes mellitus in elderly people is a worldwide disturb of the actually, this work was done by a research at the PubMed database.

Background: The cardiovascular characteristics expressed the quality of life meliorate, the risk factors that occurs, the use of non-invasive cardiovascular tests, the diabetes prevention programs, and the new physical therapies.

Material and methods: The research was done through of the use of the key-words: hypertension and cardiovascular diseases and diabetes and elderly and therapy, and exercise in PubMed database.

Results: It was founded 36 publications about this theme and put all together to find characteristics that are bellowed to these cardiovascular diseases.

Conclusion: This new short review not pretends to fulfil the theme but it was to show ways of successful treatments.

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Introduction

The cardiovascular disease (CVD) produced by the association of the hypertension and type 2 diabetes (T2D) in elderly people is a worldwide disturb of the actually [1]. Their coexistence in the same elderly individual is not a coincidence; aspects of the pathophysiology are shared by both disorders, mainly which are related to obesity and insulin resistance. The T2D is associated with both macrovascular and microvascular disease. Chronic hyperglycaemia and insulin resistance play an important role in the initiation of vascular complications of diabetes and involve a number of mechanisms including increased formation of advanced glycation end products, oxidative stress and inflammation [2].

Physical activity has a range of physical and psychological health effects for people of all ages, and structured exercise programs are a type of physical activity and have been found to be beneficial in older people. To prevent falls, carefully designed, structure exercise programs, increase muscle strength and enhance balance in older people [3].

Cardiovascular Diseases (CVD) also has a profound impact on physical and mental health, self-esteem, and the daily lives of affected individuals. It was estimates that between 1990 and 2010 the disability-adjusted life-year of CVDs increased by 23% in average, becoming the leading cause of disability-adjusted lifeyears worldwide. To reduce acute evens, an appropriate long-term management of CVD is fundamental, and health expenditure for improving life expectancy and quality of life [4].

Physical health and physiological parameters have been shown to be beneficial for improving physical activity, as well as reducing complications and mortality [4].

Systematic review found that recent studies focusing on exercise program adherence in older adults have used a variety of methods to measure adherence. Adherence to central-based exercise programs is relatively easy to document but adherence to home-based exercise currently relies on self-report, which may overestimate or underestimate actual exercise frequency and duration. In the future, technology may enable more accurate measurement of adherence in home-based physical activity studies [3].

This work was done by a research at the PubMed database in the last five years searching publications using of key-words related to hypertension and cardiovascular diseases and diabetes and elderly and therapy, and exercise.

Material and Methods

This work was done with free researching in PubMed database (https://www.ncbi.nlm.nih.gov/pubmed/) that comprises more than 29 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

This work was done by a research at the PubMed database through the use of the key-words: hypertension and cardiovascular diseases and diabetes and elderly and therapy, and exercise. We found citations using the criteria filters as: Review publications, presenting clinical trial, that it was free full text, between the last 5 years, and data obtained in Humans. As it was done in a database online no informed consent was needed. The Institution was not made an ethical consent with this work because it was a review job.

Results

It was founded 36 publications about this theme and put all together to find characteristics that are bellowed to these cardiovascular diseases. Works done not in English and about association with other diseases was excluded. Details about treatment with exercises presented in 8 publications were showed in table 1.

Table 1: Exercises program application on cardiovascular diseases associated with T2D and hypertension

Article	Purpose	Results	Conclusion
1-Petrie et al, 2018	To discuss the physiological features of vascular complications associated with diabetes and hypertension.	Some vascular mechanisms that predispose to conditions, glycation, oxidative stress, inflammation, the immune system and microRNA.	To introduce new agents that may have vasoprotective therapeutic potential in diabetes.
3-Picorelli et al, 2014	How has adherence been measured in recent prospective studies focusing on adherence to exercise programs among older people?	Nine eligible papers were identified. The most common measures were the proportion of participants completing exercise programs.	Older people adherence to exercise programs is most commonly measured with dropout and attendance rates and is associated with a range of program and personal factors.
6-De Rooij et al, 2014	To develop comorbidity-adapted exercise protocols for patients.	The number of exercise protocols could be reduced to three: one for physiological, one for behavioural, and one for environmental adaptations.	Comorbidity-adapted exercise protocols for patients were developed providing guidance in clinical trial.
8-Baggetta et al, 2014	It was looked at possible differences in baseline risk factors and mortality between subjects.	The incidence rate of mortality was higher in non-eligible vs. eligible non-randomized patients. The crude excess risk of death in non-eligible patients was reduced.	Extending data analyses and outcome reporting also to subjects not taking part in a trial may be helpful to assess the representability of the study population.
13-Poitras et al, 2015	To test the hypothesis that type 2 diabetes shows the dynamic adjustment of exercising muscle perfusion and blunts the steady state relative to controls.	The overall response speed was not different between groups nor was the change from baseline to steady state.	Despite a transient amplitude impairment at the outset of exercise, there is no robust or consistent effect of T2D on top of comorbidities or moderate exercises.
14-Lin et al, 2015	To perform a meta-analysis of randomized control trials to quantify the impact of cardiorespiratory exercises.	Exercise significantly raised absolute and relative cardiorespiratory fitness.	Exercise improved cardiorespiratory fitness and some cardiometabolic markers.
19-Petralli et al, 2016	To investigate the effect of a 12-week aerobic, resistance, or combined training program on endothelial function and assess associated effects on blood pressure individuals.	Expected evidence of cardiovascular protective effects of different types of exercise training in hypertensive individuals.	It can provide scientific evidence for the prescription of exercise programs for vascular protection targeting hypertensive individuals.
21-Slentz et al, 2016	Determine how much the effect on measures of glucose homeostasis of a 6 month programme.	The presence clinical efficacy trial showed that a high moderate-intensive exercise alone was very effective.	The findings were important for the choice of clinical intervention to prevent T2D for patients of high risk.

Discussion

The community-based lifestyle management programs produced short-term beneficial changes in activity, diet, and clinical parameters in elderly patients with mild diabetes or hypertension [5]. Comorbidity-adapted exercise protocols for elderly patients were developed, providing guidance in clinical reasoning with regard to diagnostics and treatment [6].

The intervention was more effective than usual care (short-term diabetes education) at improving glycaemic control, but not weight, in low-income African Americans with comorbid diabetes and hypertension [7]. Deambulation ability mostly explains the difference in survival rate in non-eligible and eligible non-randomized patients in the EXCITE trial. Extending data analyses and outcome reporting also to subjects not taking part in a trial may be helpful to assess the representability of the study population [8].

Adipose tissue generated mediators of cardiovascular risk can be improved with weight loss [9]. Vitamin D plus calcium supplementation did not significantly reduce HF incidence in the overall cohort, however, it was beneficial among postmenopausal women without major HF precursors while of little value in high-

risk subgroups [10]. Among overweight and obese adults with T2D, both intensive lifestyle intervention and frequent goal-based monitoring with pharmacological management can be successful strategies for blood pressure control [11]. The dietary approaches to stop hypertension diet and increased walking were associated with clinically significant reductions in ambulatory blood pressure monitoring values in hypertensive patients with T2D [12].

Despite transient amplitude impairment at the onset of exercise, there is no robust or consistent effect of T2D on top of the comorbidities and medications, typical of this population on the overall dynamic adjustment of leg blood flow, or the steady-state levels achieved during low- or moderate-intensity exercise [13]. A meta-analysis showed that exercise significantly improved cardiorespiratory fitness and some cardiometabolic biomarkers. The effects of exercise were modified by age, sex, and health status. Findings from this study have significant implications for future design of targeted lifestyle interventions [14].

Except for diabetes, the lifestyle intervention was successful in increasing physical activity, improving the hypertension control, and decreasing lipid profile disorders, obesity, and tobacco use in the study group [15]. Despite the constant new evidence on how to best treat patients who have suffered a stroke, the risk of stroke recurrence remains unacceptably high, thus evidencing the need for novel therapies [16]. The dietary approaches to stop hypertension model and the plant nutrition model also have proven to be beneficial. The data on low-fat and low-carbohydrate diets are inconclusive [17].

Comorbidities such as cardiovascular disease, hypertension and diabetes mellitus as well as the level of physical activity prior to end-stage renal disease could predict leisure-time physical activity among patients receiving hemodialysis therapy [18]. Knowing the magnitude of improvement of endothelium-dependent vasodilation for the different types of exercise training can provide scientific evidence for the prescription of exercise programs for vascular protection targeting hypertensive individuals [19]. Health education interventions are necessary and effective in modifying lifestyles. The calculation of cardiovascular factors should serve to implement preventive measures to reduce the factors of cardiovascular risk [20].

In the present clinical efficacy trial it was found that a high amount of moderate-intensity exercise alone was very effective at improving oral glucose tolerance despite a relatively modest 2 kg change in body fat mass. These data, combined with numerous published observations of the strong independent relation between postprandial glucose concentrations and prediction of future diabetes, suggest that walking ~18.2 km (22.3 km prescribed with 81.6% adherence in the 67 KKW moderate-intensity group) per week may be nearly as effective as a more intensive multicomponent approach involving diet, exercise and weight loss for preventing the progression to diabetes in prediabetic individuals. These findings have important implications for the choice of clinical intervention to prevent progression to T2D for those at high risk [21]. Long-term exercise adherence was associated with participation in sport activities and self-rated health at baseline [22]. "Walking" was more prevalent than moderate/vigorous physical activity and was consistently associated with a better physical quality of life among those at risk or with cardiovascular disease. These findings should be considered in the design of public health interventions designed to increase physical activity and improve quality of life [4].

These characteristics expressed the quality of life meliorate, the risk factors that occurs, the use of non-invasive cardiovascular tests, the diabetes prevention programs, and the new physical therapies.

Conclusion

This new short review not pretends to fulfil the theme but it was to show ways of successful treatment.

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Conflict of Interest

The authors declare that it has not conflict of interest of any kind about this work.

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