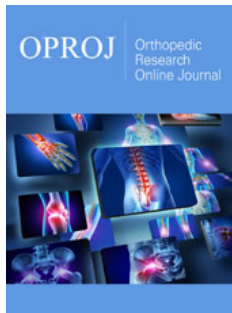



A Narrative Review of the Impact of Aerobic Training on the Prevention and Treatment of Obesity-Related Hypertension

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Abstract

Introduction: Obesity related hypertension has been appearing as a challenging health problem for years all over the world. For this reason, it has been underlined. That medical treatment methods should be combined with physical exercises. Recent studies show that aerobic exercises such as cycling, jogging assist weight loss in obese patients, which will lead the success of the medical treatment of hypertension.

Material and methods: In the search for scientific literature related to this review the US National Library of Medicine (PubMed) used MEDLINE and Sport discuss data and the terms 'aerobic exercise', 'hypertension', 'physical exercise' and 'obesity' were used. The relevant literature has also taken its source from the research of relevant articles from reference lists derived from data studies.

Result: Physical exercise, especially aerobic exercise has a significant role both in the treatment and prevention periods of obesity-related hypertension. In this sense, since aerobic exercises have been reported to provide benefits, it becomes a much more effective method in the treatment of hypertension, when the medical treatments of hypertension patients are combined with aerobic exercise programs.

Discussion: The regular exercise habits should also be taken into account as an effective method in the treatment of hypertension by taking care of the intensity and duration of the exercise to be applied should be considered in exercise planning.

Keywords: Aerobic exercise; Hypertension; Obesity

Introduction

The pressure that blood makes on the blood vessel wall is known as blood pressure (tension) and when blood pressure is higher than normal, this is called hypertension. In hypertensive individuals, risk factors which pertain to a great deal of systemic diseases, especially cardiovascular diseases, are significantly at high levels when compared to those who are healthy. Arterioles have the capacity of vasoconstriction or vasodilation when they're stimulated by some neural and chemical factors. When the diameter of arterioles enlarges, blood can easily move and heart can pump blood without difficulty, on the other hand, when arterioles become narrow, the movement of blood grows difficult. In this way, in the event that the heart needs to pump blood with high and strong pressure, hypertension develops [1]. For blood pressure values that are measured in rest position, normal blood pressure is accepted as under 120/80mmHg. Blood pressure values that are over 120/80mmHg (normal blood pressure), are defined as High Tension (Prehypertension, Phase 1 Hypertension, Phase 2 Hypertension); the follow-up and treatment of it should be regulated [2].

Those who have the values of 120-139/80-89mmHg which are defined as prehypertension, may be able to reduce their tension values under 120mmHg/80mmHg before they develop hypertension if they practice an appropriate exercise program, change their lifestyles like diet and lose weight. Therefore, only lifestyle change is recommended for those who participate in

Prehypertension risk groups, while in addition to lifestyle change, drug therapy is recommended for those with Phase 1 Hypertension or higher risk cases. The risk of developing hypertension at later ages is %90 for a person who has normal blood pressure values and does not change his/her lifestyle [2].

Hypertension is a problem that threatens the health of people and society and if it's not controlled by proper treatment methods, it may lead to many fatal diseases like heart attack, stroke and renal impairment [3]. On the other hand, there's a close relationship between blood pressure and cardiovascular diseases and the risk of developing diseases like heart attack, coronary failure, stroke, eye and kidney diseases will increase as long as tension values go up [4-6].

On the other hand, it's stated that the adult population has 20%-25% hypertension prevalence in more developed industrial societies. It's also thought in developed countries that only approximately half of them is diagnosed. In the USA, %27.4, in Germany %22.5 of those who are diagnosed have received sufficient treatments [7]. The rate of hypertension patients whose blood pressures are under control is %19 in Canada, %6 in the United Kingdom [8]. Among the factors leading to hypertension, there are at a very high rate (over %95) human metabolic structure including genetic factors and stress induced by environmental conditions, obesity caused by poor nutrition and sedentary lifestyle unprovided with physical activity. Kidney, vascular or hormonal diseases are responsible for the rest part (%3-5) [9].

It's known that exercise has a protective effect against hypertension in treatment and control. Exercise programs containing especially aerobic activities for adults with normal and hypertensive blood pressure have protective effects against the development of hypertension [10]. Besides exercise's positive contributions to hypertension treatment, it's also determined that it can reduce the dose of drug used in hypertension treatment or eliminate the need of antihypertensive drugs [11]. Likewise, studies show that exercise reduces the risk of developing heart diseases and other chronic diseases, helps prevent obesity, consolidates muscle, bone and joints, and improves the quality of life. In order that the remedial effect of exercise in hypertension is at top-end, its severity, type, frequency and duration are essential. Literally exercise programs that should be run by hypertensive individuals should include continuous and rhythmic aerobic exercises concerning large muscle groups. These aerobic exercises are recommended as preferably at least between 3 and 5 days per week, moderate (%40-%60 VO₂max) and continuous or intermittent for 30-60min [12,13].

Aerobic exercises are preferred as physical activity for the treatments of patients with hypertension [14,15]. Apart from increasing oxygenation of cardiac muscle, aerobic activities also help reaching ideal weight, reducing cholesterol level, controlling blood pressure and these metabolic developments also contribute to decrease psychological stress level, as a result, provides positive improvements in hypertension treatment [16].

Discussion

In a study carried out by Lee et al. [16] with 27 randomized control trials consisting of 1842 participants, an exercise program of walking for a mean of 19 week, which is between 4 days and 26 weeks, as an average of 36.5min/day was practiced and a significant reduction of systolic blood pressure (5.2 to 11.0mmHg) and diastolic blood pressure (3.8 to 7.7mmHg) was observed [17].

Cornelissen and Smart also conducted a study with 105 trials including 3957 participants and a program of moderate aerobic exercise consisting of walking and jogging 3-5 times per week and 30-60 minutes per session for 4 and 52 weeks was carried out. As a result, a reduction in systolic blood pressure of 3.5mmHg and in diastolic blood pressure of 2.5mmHg was found out [18].

In addition, in a study carried out by Fagard et al. [18] consisting of 72 trials with an average of 40 participants per trial, 40 minutes sessions 3 times a week for 16 weeks at an average intensity of 65% of HR reserve, which is the difference between a person's maximum HR and resting HR, it was found out that a reduction in systolic BP of 6.9mmHg and in diastolic BP of 4.9mmHg had been observed [19].

Besides, in a study carried out by Cornelissen with 15 trials containing 633 participants, who practiced an exercise for 6-52 weeks, 30-60 minutes per session, 2-5 times per week at 50%-70% HR reserve, it was found out that during daytime, a reduction in systolic BP of 3.2mmHg and in diastolic BP of 2.7mmHg was observed.

Conclusion

A large number of studies have been carried out to prevent hypertension, which has been increasing in recent years, or to find appropriate treatments, and numerous new treatment methods have been introduced. Since the positive effects of exercise have been proven many times in different studies, the positive effects of exercise in the prevention and treatment of hypertension cannot be ignored. In this sense, it is clear that especially aerobic exercises can provide important results for hypertension patients. Therefore, when medical treatments of hypertension patients are combined with exercise, it becomes a much more effective and powerful method in the treatment of hypertension, as indicated. For this reason, the effect of regular exercise habits should also be taken into account, and various factors such as the intensity and duration of the exercise to be applied should be considered in exercise planning.

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