



Effect of Aerobics Exercise and Dietary Habits on Blood Pressure in Hypertensives

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ABSTRACT

The aim of the study is to verify how blood pressure is altered by aerobics and dietary habits among hypertensive patients. High blood pressure is a major risk factor for stroke, coronary heart disease, end stage renal disease and congestive heart failure. Hypertension is generally treated by antihypertensive drugs which shows significant reduction in blood pressure. Any medication can cause side effects and high blood pressure medications are no exception, alternatively exercises and dietary habits are a good cure for hypertension. For the study 30 volunteers who were hypertensive were included and divided into 2 groups, namely participants with vegetarian diet and non vegetarian diet and their maximum (systole) and minimum (diastole) blood pressures were measured using an automatic blood pressure monitor. The participants were made to undergo a 3 months of regular aerobics exercise and the variation in blood pressure was evaluated using spss software. On analyzing the results it was observed that regular aerobics exercise tend to reduce the blood pressure among both the groups but the reduction was more among participants with vegetarian diet. Exercises for the treatment and prevention of hypertension has increased, one of the most common exercise is aerobics. So this study is done to know the effect of aerobics and dietary habits on blood pressure in hypertensive patients.

Keywords: Hypertensive patients, Blood pressure, dietary habits, aerobics exercise.

INTRODUCTION

Blood pressure (BP) is the pressure exerted by circulating blood upon the walls of blood vessels. Blood pressure is expressed by two measurements, the systolic pressure and diastolic pressure, which are the maximum and minimum pressures, respectively. The Normal blood pressure at the state of rest is within the range of 100–140 millimeters mercury (mmHg) systolic and 60–90 mmHg diastolic.¹ High blood pressure is present if the resting blood pressure is persistently at or above 140/90 mmHg for most adults.

Systole BP	Diastole BP	
Normal	<120	<80
Prehypertension	120-139	80-89
Stage 1 hypertension	140-159	90-99
Stage 2 hypertension	>160	>100

The amount of blood pumped by the heart and the size and condition of the arteries determines your blood pressure.² However, many other factors can affect blood pressure including the condition of your kidneys and levels of various hormones in the body. High blood pressure is a common condition in which the long-term force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease.³ Blood pressure is determined both by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries.

The more blood your heart pumps and the narrower your arteries, the higher your blood pressure.⁴ If you have high

blood pressure, the force exerted on your arteries is too high. It's so high that it creates microscopic tears in the artery walls that then turn into scar tissue. Hypertension, also known as high blood pressure, is a long term medical condition in which the blood pressure is persistently elevated in the arteries.⁵ Hypertension stresses your body's blood vessels, causing them to clog or weaken. Hypertension can lead to atherosclerosis and narrowing of the blood vessels making them more likely to block from blood clots or bits of fatty material breaking off from the lining of the blood vessel wall. High blood pressure usually does not cause symptoms. Long term high blood pressure is a major risk factor for coronary artery disease, stroke, vision loss, chronic kidney disease, heart failure and peripheral vascular disease. Hypertension and prehypertension have been increasing among children and adolescents since the 1990s.^{6,7} Hypertension affects approximately 50 million individuals in the United States and approximately 1 billion worldwide.⁸ Any medication can cause side effects and high blood pressure medications are no exception,⁹ alternatively exercises are a good cure for hypertension. Physical activity and fitness have often been found to be inversely proportional to the incidence and severity of hypertension. Making exercise a habit can help lower your blood pressure. It also gives you more energy and is a great way to ease stress and feel better. Regular exercise is strongly recommended to reduce hypertension.¹⁰ Aerobic exercise can help lower your blood pressure and make your heart stronger.¹¹ Hypertensives are generally encouraged to "employ in aerobic exercise on a regular basis, such as walking, running, jogging or swimming for 30 to 45 minutes daily."



In people with normal blood pressure (normotensives), regular exercise reduces systolic blood pressure by 3 to 5 mm Hg and diastolic blood pressure by 2 to 3 mm Hg. In hypertensives, this effect is even more pronounced. Although heredity plays a role in blood pressure variability, diet and lifestyle exert considerable influence in blood pressure regulation.⁸ Earlier studies also suggest that non vegetarian diet leads to high blood pressure.¹² Blood pr. Therefore this study was done to know how blood pressure is altered by aerobics among hypertensive patients.

METHODS

The study was conducted among 30 hypertensive patients in an aerobics gym centre, the participants were aged between 30-60 years. The inclusive factors were the patients should not be under any medications for hypertension, the participants must be undertaking a regular diet and had no adverse oral habits like smoking and drinking alcohol and must do regular exercise.

The participants not falling under inclusive factors were excluded. The participants were explained about the study and the volunteers were included. The participants were split into two groups, first group with people having vegetarian dietary habits which included 15 participants

and another group with 15 participants having non vegetarian diet making up to a total of 30 patients.

The blood pressure of the participants were estimated twice, first time during their first visit to the aerobics center before starting their exercise and second time after 3 months of regular aerobics exercise.

During both visit the blood pressure of the patients were checked after a five minutes of rest before beginning of the workout using a automatic blood pressure monitor, the systolic and diastolic pressure were noted in mm Hg separately and the values were entered and evaluated using spss software and the results were analyzed.

RESULTS

On analysis of data it is observed that aerobic exercise causes a significant reduction in blood pressure in hypertensive patients but the decrease in blood pressure was more in patients following vegetarian dietary habits.

After aerobics exercise the mean reduction in systolic and diastolic pressure in vegetarians was 2.93 mmHg and 2.87mmHg respectively and the mean reduction in systolic and diastolic pressure in non vegetarians was 2.0 mmHg and 1.8 mmHg respectively and the “p value” of the study was less than 0.05 (p<0.05).

Table 1: Among Vegetarian Hypertensive Patients

Groups	Systolic Pressure Before Aerobics Exercise	Systolic Pressure After Aerobics Exercise	Diastolic Pressure Before Aerobics Exercise	Diastolic Pressure After Aerobics Exercise
Mean	149.8667	146.9333	94.6000	91.7333
Standard Deviation	4.24040	4.16562	1.84391	1.66762

Table 2: Among Non Vegetarian Hypertensive Patients

Groups	Systolic Pressure Before Aerobics Exercise	Systolic Pressure After Aerobics Exercise	Diastolic Pressure Before Aerobics Exercise	Diastolic Pressure After Aerobics Exercise
Mean	148.5333	146.5333	94.0000	92.0000
Standard Deviation	5.91447	5.91447	1.85164	1.85164

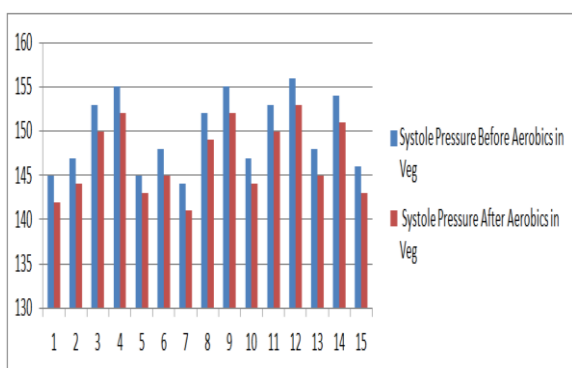


Figure 1: Variation in Systole Pressure among Vegetarians

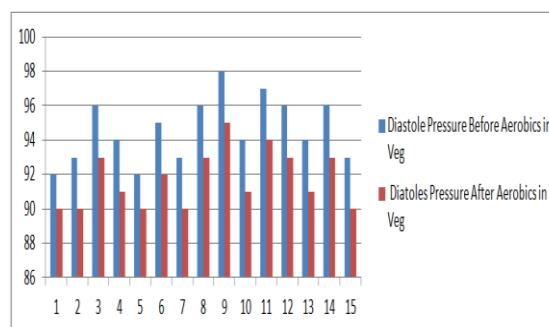


Figure 2: Variations in Diastolic Pressure among Vegetarians



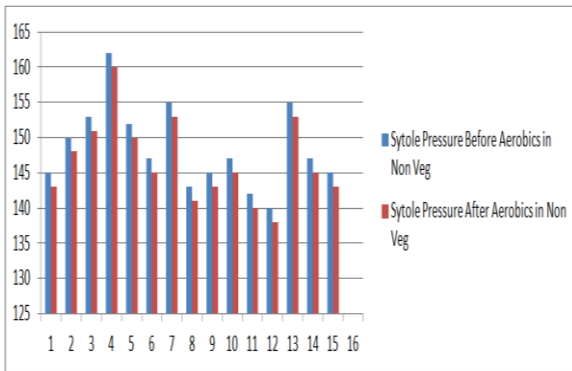


Figure 3: Variations in Systolic Pressure among Non Vegetarians

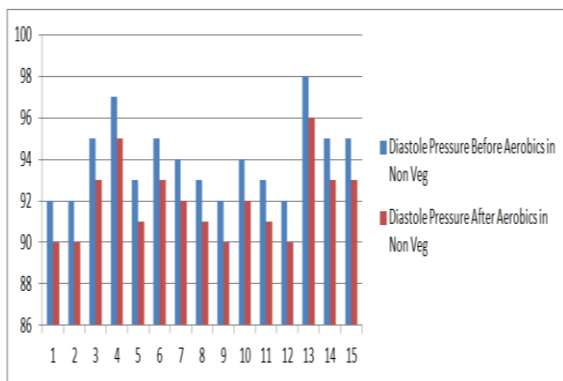


Figure 4: Variations in Diastolic Pressure among Non Vegetarians

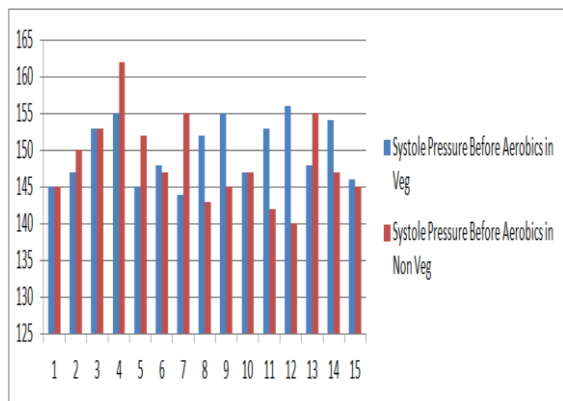


Figure 5: Variations in Systolic Pressure among Veg and Non Veg Before Exercise

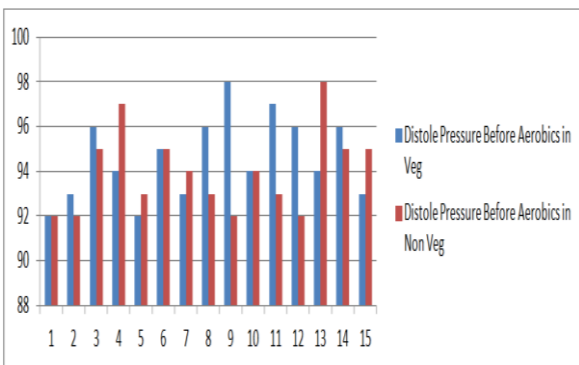


Figure 6: Variations in Diastolic Pressure among Veg and Non Veg Before Exercise

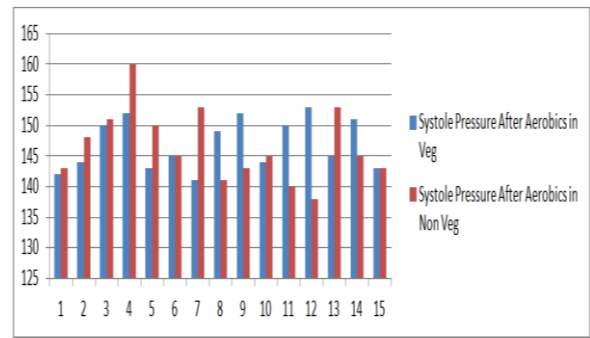


Figure 1: Variations in Systolic Pressure among Veg and Non Veg after Exercise

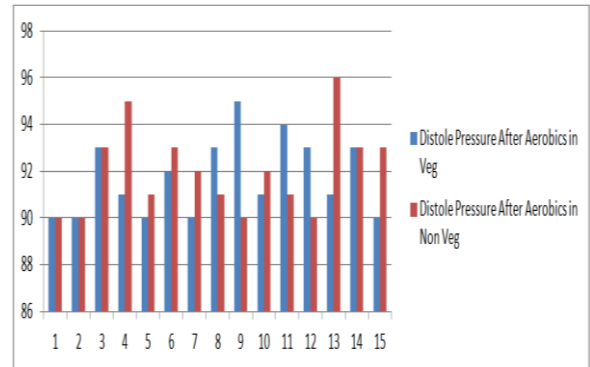


Figure 8: Variations in Diastolic Pressure among Veg and Non Veg after Exercise

DISCUSSION

Hypertension is a disease which is nowadays most commonly seen among children and adolescents and has been found that regular exercise tends to reduce the levels of high blood pressure in a very effective way among which the effects of aerobics exercise on reducing high blood pressure in hypertensive patients had been more convincing that regular aerobics exercise reduces the blood pressure by >1.5 mmHg. High blood pressure is a major risk factor for stroke, coronary heart disease, congestive heart failure, and end stage renal disease.¹³⁻¹⁵ Cornelissen¹⁶ in their study among 5223 participants after high endurance training the mean reduction in systolic blood pressure was found to be 3.5mmHg and the mean reduction in diastolic blood pressure was found to be 2.5mmHg.

In the present study it is observed that regular aerobics exercise reduces the blood pressure (both systolic and diastolic pressures) in hypertensive patients. From Figure 1 & 2 it is inferred that among vegetarians the systolic and diastolic pressures decrease after regular aerobics exercise, from Figure 3 & 4 it is inferred that also among non vegetarians the systolic and diastolic pressures decrease after regular aerobics exercise pressure is found to reduce. From Figure 5 & 6 it is inferred that the systolic and diastolic pressures are slightly more among vegetarians than non vegetarians and from Figure 7 & 8 it is inferred that the systolic and diastolic pressure are decreased more among vegetarians, therefore though there is a reduction systolic pressure than the diastolic

pressures among both vegetarians and non vegetarians but among vegetarians the reduction in blood pressure was found to be more than people following non vegetarian diet.

CONCLUSION

Hypertension is one of the most common diseases found across the world in all groups of age.

The present study helped us to identify that aerobics exercise and vegetarian diet helps to reduce blood pressure in hypertensive patients, it is more recommended than medication because aerobics exercise will not produce any side effects like medicines and further studies must be done in this field to help hypertensive patients to reduce blood pressure in a more effective manner without any side effects.

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