

## Effect of one month Treadmill Exercise on Blood Pressure

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**Abstract:** The rise of cases of Non-Communicable Diseases (NCDs) such as hypertension and diabetes in developing countries is due to the sedentary lifestyles.

**Aims and Objectives:** The aim of this study was to assess the effect of 4-week treadmill exercise on the blood pressure of young adult males.

**Methods:** 50 young healthy adult male who joined the grid iron gym was selected for the study. The mean SBP and DBP of the subject were taken pre and post 4 weeks treadmill exercise for the comparison.

**Results:** This study shows that the 4-week treadmill exercise was effective in significantly reducing mean SBP and mean DBP by 2.76mm Hg and 1.49mm Hg respectively

**Conclusions:** The risk of stroke and CHD is directly related to level of BP throughout the normotensive and hypertensive range. By reducing the SBP and DBP by life style modification and proper exercise we can reduce the case of mortality and morbidity due to hypertension, stroke and CHD.

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### I. Introduction

The rise of Non-Communicable Diseases (NCDs) in developing countries is driven by increasing sedentary lifestyles due to economic development and urbanization. In contrast to developed countries, in India, the evidence base on implementing physical activity interventions is sparse. Approximately 70% of India's population lives in rural areas with resource-poor settings, where the increasing prevalence of NCDs is becoming an added burden. In India, the prevalence of hypertension was estimated to be 159.46 per thousand<sup>1</sup> (20 – 40% in urban adults and 12 – 17% among rural adults) affecting an estimated 118 million inhabitants in 2000<sup>2</sup>. This number is projected to almost double, that is, 214 million, in 2015<sup>3</sup>. In 2003, the prevalence of CHD was 3 – 4% in rural areas and 8 – 10% in urban areas<sup>4</sup>.

An inactive lifestyle accounts for 3.3% of all deaths and 19 million Disability Adjusted Life Years (DALYs) worldwide<sup>5</sup>. Physical inactivity accounts for more than one-fifth of Coronary Heart Diseases (CHD) and has been identified as the fourth major modifiable risk factor of CHD<sup>6</sup>. It carries an increased risk of 1.2 to 2.89 times for Hypertension and Stroke, 1.05 to 2.63 for CHD, and 1.08 to 2.63 for Diabetes<sup>7</sup>. The World Health Assembly (2000) affirmed physical inactivity as a key risk factor, and the Global Strategy on Diet, Physical Activity, and Health (DPAS) was adopted in 2004<sup>8</sup>. Levels of inactivity are high in virtually all developed and developing countries. At least 60% of the world's population fail to complete the recommended amount of physical activity required to induce health benefits. The biological mechanisms responsible for the beneficial effects of physical activity are the lowering of BP, elevation in high density lipoprotein levels, increased insulin sensitivity, improved endothelial function, and reduced atherogenic cytokine production<sup>9</sup>. Worldwide, several public health recommendations have been put forward, based on the available evidence of health benefits of physical activity. The World Health Organization recommends at least 30 to 45 minutes of regular, moderate intensity physical activity on most days of the week for the prevention of hypertension, Cardiovascular Diseases (CVD), and Diabetes, respectively<sup>10</sup>.

Primary prevention of hypertension and CVD requires the understanding of a population approach to the reduction of major modifiable risk factors such as, physical inactivity. The goal of a population approach in the primary prevention of hypertension is to shift the community distribution of BP toward lower levels of 'biological normality'. Even a small reduction in the mean BP of a population will produce a large reduction in the incidence of complications such as CHD and stroke<sup>11</sup>. It has been estimated that a 2 mm Hg downward shift in the entire distribution of Systolic Blood Pressure (SBP) is likely to reduce annual mortality from stroke by 6%, CHD by 4%, and all causes by 3%. The corresponding benefits for a 3 mm Hg downward shift in SBP were estimated to be 8, 5, and 4%, respectively<sup>12,13</sup>.

## II. Material And Methods

This study was carried out on new person joining the Grid Iron Gym at Arjun Nagar, New Delhi, from February 2017 to January 2018. A total 50 adult male subjects of age 18 to 30 years were included in this study.

**Study Design:** Non Randomized Control trial

**Study Location:** Grid Iron Gym, Arjun Nagar, Safdarjung Enclave, New Delhi.

**Study Duration:** February 2017 to January 2018.

**Sample size:** 50 Adult male at Grid Iron Gym.

**Subjects & selection method:**

**Selection of cases:** Subjects for the study were selected from newly joined male candidate at Grid Iron Gym, New Delhi. A total of 50 young male subjects were selected who satisfied the inclusion and exclusion criteria after a well informed consent obtained from them.

### Inclusion criteria:

1. New candidate joined the gym.
2. Young and healthy adult male in the age group of 18 to 30 years.

### Exclusion criteria:

1. Female subject.
2. Subject suffering from any type of disease or on treatment.
3. Sports person or the subject who often involved in sports activity.

### Procedure methodology

The purpose of this study was to assess the effect of 4-week treadmill exercise on the blood pressure of young adult males. An average of 3 readings of blood pressure was taken at the time of joining the gym and after every week the blood pressure was measured, the BP at the time of joining the gym and the BP after completion of 4 weeks of treadmill exercise was selected for the comparison. Blood pressure was recorded using Omron automatic blood pressure monitor HEM – 7120.

The subjects were briefed about the purpose and significance of the study. The training was done 5 days/week for a period of 4 weeks. All the subjects were tested before and after, their completion of 4 weeks of treadmill exercise.

The treadmill exercise schedule was explained to the subjects as per the schedule given below in the table.

**Table: 1:** treadmill exercise schedule

	Duration (minutes)	Speed (km/hour)
Week 1	10	5
Week 2	15	7
Week 3	20	9
Week 4	25	11

### Statistical analysis

Data was analyzed using the SPSS Version 13. A level of  $P < 0.05$  was considered as statistically significant, 'before and after 4 weeks treadmill exercise (without controls) design' was adopted in this study. Changes in Blood Pressure (pre- and post- exercise values) were compared using the Paired 't' test.

## III. Result

**Table: 2:** Changes in mean systolic and diastolic blood pressure after 4 weeks of treadmill (n = 50)

PARAMETER	BEFORE	AFTER	P Value
Mean SBP	121.06 ± 6.3	118.3 ± 5.6	0.022
Mean DBP	81.5 ± 3.6	80.01 ± 3.8	0.046

Mean SBP was reduced from 121.06 mm Hg at baseline to 118.3 mm Hg at 4 weeks. A significant reduction of 2.76 mm Hg SBP was observed ( $P = 0.022$ ). The mean DBP fell from 81.5 mm Hg at baseline to 80.01 mm Hg at 4 weeks. A significant reduction of 1.49 mm Hg DBP was observed ( $P = 0.046$ ).

## IV. Discussion

This study shows that the 4-week treadmill exercise was effective in significantly reducing mean SBP and mean DBP by 2.76 mm Hg and 1.49 mm Hg respectively.

In this study all the subjects were normotensive then also the mean SBP and mean DBP reduced significantly so we can say that the exercise is effective in lowering the mean BP not only in hypertensive individuals but also in normotensive person. Although the relative risk of stroke and CHD in hypertensive is greater than in normotensive, the absolute number of death from these causes is greater in normotensive adults<sup>14</sup>.

In this study only the normotensive adult was included whereas there are other study which has taken both the hypertensive and normotensive individuals and has shown the significant reduction of BP in hypertensive and normotensive subject and reduction of BP in hypertensive is more than the normotensive<sup>11</sup>.

Many studies has shown that with regular physical exercise and aerobic exercise not only the BP decreases significantly but there is significant reduction of body weight, BMI, blood sugar and cholesterol level in the blood<sup>15</sup>.

## V. Conclusion

The risk of stroke and CHD is directly related to level of BP throughout the normotensive and hypertensive range<sup>16</sup>. By reducing the SBP and DBP by life style modification and proper exercise we can reduce the case of mortality and morbidity due to hypertension, stroke and CHD.

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