J. Res. Educ. Indian Med., July.-Dec.2015; (3-4): page 00-00 . **ISSN 0970-7700**

Published Online :Feb 27, 2015 doi:10.5455/JREIM.82-141603971

ASSESSMENT OF PHYSICAL ACTIVITY AND HYPERTENSION AMONG EDUCATED ADULTS

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Abstract: ***Introduction:*** **-** High blood pressure, is the most common cardiovascular disease and is defined as chronically elevated blood pressure greater than 140/90 mmHg. If not treated this disease is a serious public health problem and significantly increases one's risk of developing coronary artery disease and stroke. Physical activity is one of the main techniques used to reduce blood pressure and other cardiovascular diseases, reducing morbidity and mortality. Several epidemiological studies have reported an inverse relationship between blood pressure and physical activity. ***Objective:*** **-** To assess the prevalence of hypertension and the relationship between physical activity and hypertension among adults. ***Methodology:*** **-** The sample size was calculated taking the prevalence of hypertension as 30%, level of significance 5%, with permissible error of 10%, the total sample size to be taken was 92 aged 30 to 69 years including 10% as the non-compliance rate. Blood pressure was measured with the help of WHO recommended digital BP measuring machine (OMRON make model HEM 907) during interview in sitting posture. Physical activity was evaluated by International Physical Activity Questionnaire (IPAQ) recommended by WHO to measure physical activity among adults from 15-69 years. ***Statistical Analysis:*** Data was analyzed with the help of statistical software SPSS 16.0 trial version. Physical activity scores were used to categorize the respondents and the relationship with their BP was observed. ***Results and conclusion:-*** The prevalence of hypertension is 64.0% in physically highly active group and 50.0 % in physically less active group. This shows that physical activity prevent and control hypertension along with some other variables.

Keywords: Hypertension, physical activity, IPAQ (International Physical Activity Questionnaire)

INTRODUCTION

Physical inactivity is a leading risk factor for disease and death and thus accounts for more than five million deaths worldwide each year.[9] Regular participation in physical activity can reduce the risk of adverse health outcomes and improve chronic health conditions.[10,11] Recently published studies suggest that moderate-intensity physical activity may be effective in lowering blood pressure. Proposed mechanisms for the blood pressure-lowering effects of exercise include neurohumoral, vascular, and structural adaptations. Regular physical activity has been shown to reduce the risk of developing hypertension by 19% to 30%. Research has also found that having low cardio respiratory fitness at middle age is associated with a 50% greater risk of developing hypertension.[12] Sedentary lifestyle is a major risk factor for cardiovascular disease and being physically active reduces risk by 40 %.[5] Several studies support the important role of physical activity for both primary and secondary prevention of cardiovascular diseases,[8] and according to epidemiological evidence there exist positive associations between regular physical activity and health benefits. WHO recommends at least 30 minutes of regular, moderate-intensity physical activity on most days of the week to reduce the risk of diseases.[7]

Objective: To assess the prevalence of hypertension and the relationship between physical activity and hypertension among adults.

METHODOLOGY

Study Subjects- The population under study comprised faculty members from Institute of Medical Sciences, Faculty of Management Sciences and Faculty of Social Sciences of Banaras Hindu University Varanasi.

Inclusion criteria were:

· Persons with age 30 to 69 years

· Willing to participate in the study

· Only Teaching Faculty members were included (We tried to cover three faculties but those who gave consent were included till we reached the sample population)

Sample Size

The sample size was calculated taking the prevalence of hypertension as 30% (A report of multi

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centric study by Times of India on March 21, 2013), level of significance 5%, with permissible error of 10%, the total sample size to be taken was 92 aged 30 to 69 years considering 10% as the non-compliance rate.

Physical Activity Assessment

Physical activity was evaluated by International Physical Activity Questionnaire (IPAQ) recommended by WHO to measure physical activity among adults from 15-69.

Blood Pressure Measurement

Blood pressure was measured with the help of WHO recommended digital BP measuring machine (OMRON make model HEM 907) during interview with sitting posture. Two BP readings were taken with a gap of one minute and the average of these two readings was used to consider the BP status.

Body Mass Index (BMI)

We used participants' weight with the help of weighing machine and self-reported height to estimate BMI and to categorize them as normal weight (BMI <25 kg/m^2) or overweight or obese (BMI e"25 kg/m^2).

RESULTS

In **table-1** it is clear that 44.6% of the respondents comes under the category of moderate physical activity and there is a minor difference between the high & low physical activity group that is 26.0% & 29.3% respectively.

We can also see that majority of the respondents from both groups (Faculties of medical and other than medical sciences) are coming under the moderate physical activity category. Talking about the high physical activity group we can observe that the percentage of the respondents from medical sciences is less (19.6%) as compared to other than medical sciences group (34.1%).Statistically no association was found.

In **table-2** we can see that majority (46.7%) of the respondents falls in Normal Category and 42.4% respondent are pre-hypertensive while the percentage of Isolated systolic hypertension and stage 1 hypertension is 4.3% and 6.5% respectively. Almost half of the respondents are either suffering from or at risk of hypertension.

Table-3 indicates that out of 92 respondents only 22 (23.9%) were diagnosed as hypertensive previously in which the percentage of the male respondents was 17 (29.3%) which was higher than female respondents 5 (14.7%). Which is contrary to a study conducted by Bharucha et al (2003) among Parsi community of Bombay, in which 47% male and 56% female were hypertensive and they were aware of their hypertensive status.[3]

Table-4 BMI categorization of the respondents indicates that more than half (55.4%) of the respondents are in normal BMI category while 26.0% of the respondents are overweight and the percentage of Obese is 18.4%.

Here we can say that more than half of the total respondents (61.3%) from other than medical sciences faculty are having good nutritional status and if we talk about the overweight respondents then we can say that medicine faculty is having higher percentage (31.3%) of overweight respondents as compared to the respondents from other than medical sciences faculty group (19.5%).

Table–5 shows consumption of tobacco and alcohol by the respondents according to their hypertensive status. In above table it is clear that 14.1% people consume tobacco while the percentage of alcohol consumption is only 12.0%.

It can also be seen that 10% respondents from prehypertensive group are taking alcohol and tobacco as well and respondents from Stage 1 hypertension group neither takes tobacco nor the alcohol.

From **table-6** it can be clearly observed that more than half of the respondents (53.2%) are hypertensive and 46.7% of respondents are having normal blood pressure. If we observe category wise, we can see that 64.0% of respondents are hypertensive though they are highly physically active, and people who belongs to low physical activity category share same percentage (50.0%) between both the group (hypertensive and normal).

Table -1: Distribution of respondents according to Physical Activity Status

Type of Faculty	Physical Activity Category of Respondents			
	High	Low	Moderate	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Medical Sciences	10 (19.6)	16(31.3)	25(49.0)	51(100.0)
Other than Medical Sciences	14(34.1)	11(26.8)	16(39.0)	41(100.0)
Total	24(26.0)	27(29.3)	41(44.6)	92(100.0)

(x^2 =2.72, df=2, P value> 0.05)

Table-2: Distribution of respondents according to level of blood pressure in Medical and Non-medical groups

Type of Faculty	Hypertension Status of Respondents				
	Isolated systolic hypertension	Normal	Prehypertension	Stage 1 hypertension	Total
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Medical Sciences	3(5.9)	22(43.1)	23(45.0)	3(5.9)	51(100.0)
Other*	1(2.4)	21(51.2)	16(39.0)	3(7.3)	41(100.0)
Total	4(4.3)	43(46.7)	39(42.4)	6(6.5)	92(100.0)

* Other than Medical Sciences

Table-3: Gender wise distribution of faculties in relation to their hypertensive status

Gender of Respondents	Ever Diagnosed as Hypertensive?		
	No	Yes	Total
	No. (%)	No. (%)	No. (%)
Female	29 (85.2)	5(14.7)	34(100.0)
Male	41(70.6)	17(29.3)	58(100.0)
Total	70 (76.0)	22(23.9)	92(100.0)

Table-4: Distribution of Respondents according to their Nutritional Status (BMI category)

Type of Faculty	BMI Category of Respondents			
	Normal	Overweight	Obese	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Medical Sciences	26(51.0)	16(31.3)	9(17.6)	51(100.0)
Other than Medical Sciences	25(61.0)	8(19.5)	8(19.5)	41(100.0)
Total	51(55.4)	24(26.0)	17(18.4)	92(100.0)

*One underweight respondent has been clubbed with normal category

Table-5: Consumption of Tobacco and Alcohol by the Respondents According To Their Blood Pressure Status

Blood Pressure Status	Consume Tobacco			Take Alcohol		
	No	Yes	Total	No	Yes	Total
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Isolated systolic hypertension	3(75.0)	1(25.0)	4(100.0)	4(100.0)	0(.0)	4(100.0)
Normal	35(81.3)	8(18.6)	43(100.0)	36(83.8)	7(16.2)	43(100.0)
Pre-hypertension	36(90.0)	4(10.0)	40(100.0)	36(90.0)	4(10.0)	40(100.0)
Stage 1 hypertension	5(100.0)	0(.0)	5(100.0)	5(100.0)	0(.0)	5(100.0)
Total	79(85.8)	13(14.1)	92(100.0)	81(88.0)	11(12.0)	92(100.0)

Table-6: Relationship between Physical Activity and Hypertension

Physical activity category	Blood Pressure Category of Respondents		
	Hypertensive	Normal	Total
	No. (%)	No. (%)	No. (%)
High	16(64.0)	9(36.0)	25(100.0)
Low	13(50.0)	13(50.0)	26(100.0)
Moderate	20(48.7)	21(51.2)	41(100.0)
Total	49(53.2)	43(46.7)	92(100.0)

(x^2 =1.98, df=2, P value> 0.05)

DISCUSSION

The primary prevention of hypertension has become an important global public health initiative. Physical activity is commonly recommended as an important lifestyle modification that may aid in the prevention of hypertension. The level of awareness, treatment and control of hypertension varies considerably between countries and regions. World Health organization survey reported that blood pressure control is suboptimal in between half and two thirds of hypertensive patients in the majority of countries they surveyed in MONICA Project.[1]

There were many studies in literature that reported the effect of physical activity on controlling hypertension. Bacon *et al*. reported that diet and exercise, alone or combined, were effective in reducing the BP in subjects with mild hypertension, with improvements similar to drug therapy in patients with higher baseline BP level.[2]

Fagard and Cornelissen in their article on effect of exercise on blood pressure control in hypertensive patients stated that exercise can be considered as a cornerstone therapy for the prevention, treatment, and control of hypertension.[6]

The United States National High Blood Pressure Education Program Coordinating Committee has recommended six approaches with proven efficacy for the primary prevention of hypertension. These interventions include weight loss, dietary sodium reduction, increased physical activity, potassium supplementation and modification of whole diets.[4]

CONCLUSION

In light of above mention findings and discussion we can conclude that being physically active can be an important component to prevent hypertension but mere being physically active is not the only solution to prevent it as we can see in results that most of the people from highly physically active group are hypertensive. It also indicates that physical activity prevents and control hypertension along with some other variables. So there is a need to plan more strategic studies in this direction to find out what are the specific causes of hypertension and what specific measures should be kept in mind to control hypertension.

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