# **Original Research Article**

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20184583

# A study to evaluate scope of preventive strategies in modifiable risk factors of hypertension

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Received: 21 August 2018 Accepted: 01 October 2018

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#### **ABSTRACT**

**Background:** Hypertension is a vascular disorder associated with high morbidity and mortality. Risk factor prevention plays key role in control of the non-communicable diseases. Current study was conducted to assess prevalence of risk factors related to hypertensive patients.

**Methods:** This cross-sectional study was conducted for the period of six months (January to June 2018). Total 672 hypertensive patients were included in this study and subjected to evaluation of modifiable risk factors like obesity, lack of exercise, smoking, dyslipidemia and pre-existing diabetes mellitus along with non-modifiable risk factors like positive family history and age.

**Results:** On risk factor evaluation of 672 hypertensive patients it was found that 601(89.4%) patients had lack of exercise, 210 (31.2%) patients had dyslipidemia, 190 (28.2%) patients were smokers, 164 (24.4%) patients had diabetes mellitus before emergence of hypertension, 132 (19.6%) patients were obese and 498 (74.1%) patient had age more than 60 years, 94 (13.9%) patients had family history of hypertension.

**Conclusions:** High prevalence of risk factors for this non-communicable disease in Indian community is alarming. Dealing with modifiable risk factors by health education, promotion of exercise, favourable life style, dietary modifications, cessation of smoking, screening programmes for early detection of deranged blood pressure, blood sugar, lipid profile can be effective preventive strategies.

Keywords: Risk factors, Hypertension, Non-communicable diseases

#### INTRODUCTION

Non-communicable diseases like hypertension (HTN), diabetes mellitus (DM), coronary artery disease (CAD) and stroke are interlinked to each other. Emerging incidence and prevalence of these non-communicable diseases is alarming. Hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have long term elevated pressure. It has dreadful acute and chronic complications as it affects multiple systems of body. HTN is risk factor of many non-communicable diseases like DM, CAD, stroke, obesity, chronic renal disease, retinopathy. HTN has well

known risk factors like age, positive family history or heredity, obesity, lack of exercise, smoking, alcoholism, dyslipidemia and diabetes mellitus (DM). Former two risk factors are non-modifiable while remaining risk factors are categorised as modifiable risk factors. A risk factor defined as an attribute or exposure that is significantly associated with development of a disease. Non-modifiable ones can-not be altered by any intervention while modifiable risk factors can be altered through healthy lifestyle, control of weight, and enhanced physical activity. As we are aware that HTN enhances the morbidity and mortality two to four times for CAD risk factor control can be effective not only in primordial and

primary prevention but also in secondary prevention of the disease.<sup>6</sup> This study was structured to assess the prevalence of risk factors of HTN in given population in order to evaluate scope of preventive measures for modifiable risk actors and to plan better strategies of control.

#### **METHODS**

Six hundred seventy-two hypertensive patients were included in this study on indoor and outdoor basis by complete enumeration. These study subjects comprised both newly diagnosed and old cases of hypertension. Duration of study was 6 months (January to June, 2018) and this cross-sectional type of observational study was

conducted at a tertiary health care institute of southern Rajasthan at department of General Medicine.

All selected patients were subjected to detail history and clinical examination after informed consent and a pretested questionnaire was used to collect data on socio-demographic, behavioural, and dietary factors. Anthropometric measurements of weight and height and blood pressure measurements were taken using the standard methodology. Common modifiable and non-modifiable risk factors were considered for evaluation of cases (Table 1). All selected subjects were evaluated for risk factors like age, positive family history of HTN, obesity, lack of exercise, smoking, dyslipidemia and DM (if present before the emergence of HTN).

Table 1: Criteria for risk factors under evaluation.

Risk factor		Criteria
Non-	Age	More than 60 years
modifiable	Family history	History of hypertension in family
Modifiable	Obesity	BMI equal or more than 25 kg/m <sup>2</sup>
	Smoking	More than 5 packs per year
	Lack of physical activity	Less than 30 minutes of walk per day for at least five days in a week
	Dyslipidemia	Serum total cholesterol more than 200 mg/dl or
		Serum triglycerides level more than 150 mg/dl or
		Serum HDL cholesterol less than 50 mg/dl or
		Serum LDL cholesterol more than 100 mg/dl
	Diabetes Mellitus	If present before emergence of the disease of concern

Age more than 60 years was considered as one of the risk factors for development of the disease under evaluation. Body mass index (BMI) equal or more than 25 kg/m² was taken as criteria for obesity. A criterion for appropriate physical activity was taken as 30 minutes of walk per day for atleast five days in a week. A criterion for significant smoking was taken as more than 5 packs per year. Total cholesterol more than 200 mg/dl, triglycerides more than 150 mg/dl, HDL cholesterol less than 50 mg/dl or LDL cholesterol more than 100 mg/dl was taken as criteria of dyslipidemia. DM was taken as risk factor only if present before emergence of the disease of concern.

## **RESULTS**

Six hundred and seventy two hypertensive patients participated in current study with age ranging between 18 to 80 years with male female ratio nearly 1:1. On modifiable and non-modifiable risk factor evaluation of 672 hypertensive patients it was found that 498 (74.1%) patient had age more than 60 years, 94 (13.9%) patients had family history of HTN, 132 (19.6%) patients were obese, 190 (28.2%) patients were smoker under above mention criteria, 601 (89.4%) patients had lack of exercise, 210 (31.2%) patients had dyslipidemia, 164 (24.4%) patients had DM before emergence of HTN (Figure 1).

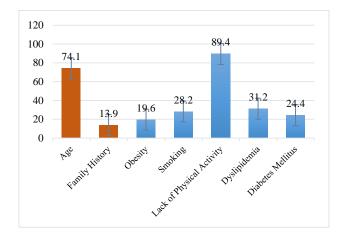


Figure 1: Distribution of modifiable and nonmodifiable risk factors in hypertensive patients.

#### **DISCUSSION**

The world is facing premature deaths each year, 15 million people die from non-communicable diseases (NCDs) between the ages of 30 and 69 years; over 85% of these "premature" deaths occur in low- and middle-income countries due to NCDs and hypertension is contributing to a major chunk. An estimate by WHO says that in 2025, an estimated 1.56 billion adults will be living with hypertension. Hypertension kills nearly 8

million people every year, worldwide and nearly 1.5 million people each year in the South-East Asia (SEA) Region. Approximately one-third of the adult population in the SEA Region has high blood pressure. About 60% of people who have diabetes also have high blood pressure. In 2015, 39.5 million of the 56.4 million deaths globally were due to non-communicable diseases.<sup>2</sup>

Current study focused on the risk factor prevalence amongst hypertensive subjects and on evaluation of 672 subjects it was found that 74.1% patients had age (>60 years) as risk factor, 13.9% had family history of hypertension positive. Modifiable risk factors like obesity were positive in 19.6% subjects, smoking in 28.2% cases, lack of exercise in 89.4%, dyslipidemia in 31.2% and DM as risk factor before emergence of hypertension was present amongst 24.4% subjects.

A study by Singh et al conducted at Varanasi reported that 32.1% subjects were smokers, only 16.4% subjects were having lack of exercise, 9.2% were obese. These results differed widely from findings of current study which found higher prevalence of obesity (19.6%), lack of exercise (89.4%), and slightly reduced number of smokers (28.2%).

Study conducted in central India by Bhadoria et al reported 19.4% subjects from urban and 4.5% subjects from rural background with positive family history of hypertension. Whereas current study reported 13.9% subjects with similar history. 'Age' as a risk factor was reported amongst only 28.4% study subjects by Bhadoria et al while our study claimed 'age' as risk factor amongst a much higher percentage of 74.1% subjects. 8

In another study by Bansal et al conducted in rural background reported males and female ratio as 1:1 which is in consensus with current study. Risk factors like obesity were found to be 9.4% amongst males and 19.0% amongst female subjects in that study which are similar to findings of current study. Smoking was found to be prevalent amongst 24% males, 7% females is in accordance with our study where 28% of total participants were found to be smokers. Dyslipdemia was in lower ranges in the study by Bansal et al with 7.2% and 8.3% only in males and females respectively in comparison to 31.2% in current study, whereas diabetes as risk factor was found only in 1.3% in males and 3% in female subjects in contrast to 24.4% in current study.<sup>9</sup> Another study done in Assam among industrial population revealed that smokers were in higher percentage (53%) among hypertensives while presence of DM was in much lower (3.96%) proportion among study population. 10 The difference in values in the studies conducted in different areas of country signifies that there is need of area wise variations in preventive strategies for effective prevention of risk factors emergence. It has been proven widely that India being diverse geographically and culturally, varies in demands of health care and policy implementation. So, it should be considered an important aspect while framing preventive strategy for modifiable risk factors of NCDs like hypertension.

#### CONCLUSION

Majority of risk factors of hypertension are present in high prevalence in Indian communities. Modifiable risk factors can be altered by promotion of exercise, favourable life style and dietary modification which can be a key-factors for prevention. Lack of exercise was most common risk factor found in the study which is an indication of sedentary life style. Young and productive age group of the country is showing deterioration in their lifestyle due to overuse of media and long screen times added to their routines. Screening and educational programmes should be initiated specially targeting young population. Government should introduce policies to stop the smoking to prevent many dreadful diseases.

### Limitations of study

This study has some limitations like all modifiable and non-modifiable risk factors were not included in the study which contribute significantly to the occurrence of hypertension due to resource constraint. Criteria for exercise were same for individuals having strenuous or sedentary lifestyle.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Mathur M, Mathur N. A study to evaluate scope of preventive strategies in modifiable risk factors of hypertension. Int J Community Med Public Health 2018;5:4849-52.