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**Original Research Article**

# Prevalence of hypertension and its associated risk factors in rural community of Barabanki

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## ABSTRACT

**Background:** Hypertension is one of the most important non-communicable diseases. Although high blood pressure is a recognized risk factor for cardiovascular disease, the prevalence of hypertension still remains unclear for most populations. The objectives of the study were to estimate the prevalence of hypertension in rural area of Faizabad and to identify the associated risk factors for hypertension.
**Methods:** This community-based cross sectional study was carried out among 300 adults from a randomly selected village in rural health training centre, Safdarganj who were aged 18 years and above over a period of 3 months from March 2019 to May 2019. Participants were interviewed and examined for the assessment of socio-demographic detail, behavioral and lifestyle risk factors of hypertension. Template generated in MS excel sheet and analysis was done on SPSS software.
**Results:** Among 300 study participants, 45.3% were male and 54.7% were female. The prevalence of hypertension was observed to be 10.33%. It was found to be more common in males. Prevalence increased as the age increased. The prevalence of hypertension was high among obese and those consuming more than 2 spoons of salt every day.
**Conclusions:** Prevalence of hypertension is different in different parts of the country. Higher age, male sex, tobacco use, obesity, less physical activity and high salt intake are significantly associated with hypertension.

**Keywords:** Hypertension, Prevalence, Risk factors, Rural

## INTRODUCTION

Hypertension is the commonest cardiovascular disorder and one of the important non-communicable diseases due to its role in the causation of coronary heart disease, stroke and other vascular complications. It is an important public health issue for developed as well as developing countries.[1] An estimated 1.13 billion people worldwide have hypertension, most (two-thirds) living in low- and middle-income countries. In 2015, 1 in 4 men and 1 in 5 women had hypertension.[2] It is a main risk factor for cardiovascular morbidity and mortality, surpassing obesity, diabetes mellitus, and smoking.[3] Now it has also become a major predictor of premature death and cardiovascular disability that poses a huge economic burden to both medical cost and human capital loss.[4-6]

Hypertension or high blood pressure is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), normal blood pressure is a systolic blood pressure (BP) <120 mmHg and diastolic BP <80 mmHg.

Hypertension is defined as systolic BP level of ≥140 mmHg and/or diastolic BP level ≥90 mmHg. The grey area falling between 120 to 139 mmHg systolic BP and 80 to 89 mmHg diastolic BP is defined as "prehypertension".[7,8]

There are several factors predisposing to hypertension. These factors vary from country to country and even there is some difference between urban and rural regions of the same place.[9] Previously identified risk factors for hypertension in Indians include higher body mass index (BMI), greater age, greater alcohol consumption, sedentary lifestyle and stress.[10-12]

The ill effects of hypertension are compounded by these risk factors that increase the odds of heart attack, stroke and kidney failure. Tobacco use further increases the risk of complications among those with hypertension.[13]

This study aims to estimate the prevalence of hypertension in rural area of Faizabad. Another aim was to identify the associated risk factors for hypertension.

## METHODS

This community-based cross sectional study was carried out among adults who were aged 18 years and above over a period of 3 months from March 2019 to May 2019. The study was carried out in rural health training centre (RHTC) area of Mayo Institute of Medical Sciences (MIMS), Barabanki. RHTC of MIMS is situated in Safdarganj which is 28 kms away from it.

Optimal sample size was calculated on the basis of prior prevalence rate of hypertension of 25.9%.[13] The sample size was calculated by the formula 4PQ/D2, where P is the prevalence; Q is 100-P and D is the absolute precision, i.e., 5%. Approximate sample size came out to be 300. Study was initiated after obtaining approval from institutional ethics committee of MIMS, Barabanki. There are 25 villages near RHTC, MIMS. Out of this 1 village is selected for the study by simple random sampling. Village selected was Saidabad having population of 1546 with 242 households. After numbering these houses, first house was chosen randomly. Then every alternate house was selected (systemic random sampling) till our sample size is complete.

Adults aged 18 years or above who gave consent to participate in the study were interviewed and examined for the assessment of behavioral and lifestyle risk factors of hypertension. A semi structured questionnaire was used in the study. BP was recorded in sitting position using a mercury sphygmomanometer. Common weighing machine, and measuring tape were also used for physical measurements. During the course of the interview, two measurements of blood pressure were taken on each study participant using a standardized technique 30 min apart in the sitting position and mean value of two readings were taken as blood pressure of an individual.[14] Blood pressure measurements were made on the left arm of each study participant, using a cuff of appropriate size at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which radial pulse disappeared and then deflated slowly at the rate of about 2 mm/s. The pressure at which sounds are heard first was taken as systolic blood pressure. Diastolic pressure was measured at pressure at which kortokoff sounds disappeared. If the 2 readings differed by >10 mm of Hg a 3rd reading was taken and the 3 measurements were averaged. Body weight was measured to the nearest 0.5 kg with the subject standing motionless on the weighing machine and feet about 15 cm apart. Height was also measured (to the nearest 0.5 cm) with the participant with shoes removed and standing in an erect position against a vertical surface. Data were entered in MS Excel after generation of proper template. Data entered was then imported into SPSS software and descriptive analysis was done.

### *Inclusion criteria*

All subjects of age 18 years and above in the RHTC, Safdarganj, MIMS, all subjects of age 18 years and above who consented to participate in the study were included.

### *Exclusion criteria*

Adults who refused to participate in the study, not a resident of the village were excluded.

## RESULTS

A total of 300 study subjects were interviewed and examined for the survey. Out of these, 136 (45.3%) were male and 164 (54.7%) were female subjects. Table 1 shows that overall prevalence of hypertension in this study is 10.33%. Hypertension was found to be more common in male as compared to female. 19 out of 124 males were hypertensive while 12 out of 176 females have increased blood pressure.

Table 2 shows the socio-demographic characteristics of the respondents in the study. It can be seen that majority of the study subjects were more than 45 years of age. The prevalence of hypertension was increased as the age increased ($p<0.05$) as indicated in the Figure 1.

**Table 1: Prevalence of hypertension in the study subject.**

| Sex | Hypertensive (%) | Non hypertensive (%) | Total |
|---|---|---|---|
| **Male** | 19 (15.32) | 105 (84.68) | 124 |
| **Female** | 12 (6.81) | 164 (93.19) | 176 |
| **Total** | 31 (10.33) | 269 (89.67) | 300 |

**Table 2: Sociodemographic factors related to hypertension.**

| Variables | Category | Total | Hypertensive | Non hypertensive | $\chi^2$ | P value |
|---|---|---|---|---|---|---|
| | | | N (%) | N (%) | | |
| **Age (years)** | 18-45 | 121 | 8 (6.6) | 113 (93.4) | 6.005 | 0.049 |
| | 46-60 | 106 | 11 (10.4) | 95 (89.6) | | |
| | More than 60 | 73 | 13 (17.8) | 60 (82.2) | | |
| **Sex** | Male | 124 | 19 (15.3) | 105 (84.7) | 5.678 | 0.017 |
| | Female | 176 | 12 (6.8) | 164 (93.2) | | |
| **Religion** | Hindu | 198 | 18 (9.1) | 180 (90.9) | 1.148 | 0.56 |
| | Muslim | 91 | 12 (13.2) | 79 (86.8) | | |
| | Others | 11 | 1 (9.1) | 10 (90.9) | | |
| **Education** | Illiterate | 126 | 11 (8.7) | 115 (91.3) | 0.733 | 0.865 |
| | Primary | 92 | 11 (11.9) | 81 (88.1) | | |
| | Secondary | 58 | 6 (10.3) | 52 (89.7) | | |
| | College and above | 24 | 3 (12.5) | 21 (87.5) | | |
| **Marital status** | Married | 208 | 19 (9.1) | 194 (90.9) | 5.028 | 0.080 |
| | Unmarried | 48 | 4 (8.3) | 44 (91.7) | | |
| | Divorced or ever married or widowed | 44 | 8 (18.2) | 31 (81.8) | | |
| **Occupation** | Government | 12 | 2 (16.7) | 10 (83.3) | 4.15 | 0.386 |
| | Private | 52 | 4 (7.7) | 48 (92.3) | | |
| | Self-employed | 151 | 17 (11.3) | 134 (88.7) | | |
| | Retired | 7 | 2 (28.6) | 5 (71.4) | | |
| | Homemaker | 78 | 6 (7.7) | 72 (92.3) | | |
| | Others | | | | | |
| **Family type** | Nuclear | 118 | 10 (8.5) | 108 (91.5) | 1.023 | 0.311 |
| | Joint | 172 | 21 (12.2) | 151 (87.8) | | |
| **Number of family members** | 1-5 | 191 | 19 (9.9) | 171 (90.1) | 0.062 | 0.803 |
| | ≥6 | 109 | 12 (11.0) | 98 (89.0) | | |
| **Socioeconomic class** | I | 77 | 13 (16.9) | 64 (83.1) | 12.62 | 0.013 |
| | II | 78 | 10 (12.8) | 68 (87.2) | | |
| | III | 56 | 7 (12.5) | 49 (87.5) | | |
| | IV | 48 | 1 (2.1) | 47 (97.9) | | |
| | V | 41 | 0 (0) | 41 (100) | | |

**Table 3: Prevalence of hypertension by health and life style practices.**

| Variables | Category | Total | Hypertensive | Non hypertensive | $\chi^2$ | P value |
|---|---|---|---|---|---|---|
| | | | N (%) | N (%) | | |
| **Tobacco use** | Nonusers | 232 | 19 (8.2) | 213 (91.8) | 5.076 | 0.024 |
| | Users | 68 | 12 (17.6) | 56 (82.4) | | |
| **Alcohol use** | Nonusers | 56 | 8 (14.3) | 48 (85.7) | 1.161 | 0.281 |
| | Users | 244 | 23 (9.4) | 221 (90.6) | | |
| **Physical activity** | Inactive | 39 | 8 (20.5) | 31 (79.5) | 5.013 | 0.025 |
| | Active | 261 | 23 (8.8) | 238 (91.2) | | |
| **BMI** | Underweight | 32 | 1 (3.1) | 31 (96.9) | 11.725 | 0.008 |
| | Normal | 221 | 18 (8.1) | 203 (91.9) | | |
| | Preobese | 32 | 6 (18.7) | 26 (81.3) | | |
| | Obese | 15 | 6 (40.0) | 9 (60.0) | | |
| **Salt intake** | <1 spoon | 144 | 12 (8.3) | 132 (91.7) | 8.233 | 0.0163 |
| | 1-2 spoons | 135 | 13 (9.6) | 122 (90.4) | | |
| | >2 spoons | 21 | 6 (28.6) | 15 (71.4) | | |

Most of the study subjects (66%) in this study were Hindu by religion. It has been seen that hypertension is not related significantly with the religion, education. and occupation. Although its more common among divorced or ever married or widowed persons, there is no statistically significant relation. A statistically significant relation was found between socioeconomic status and hypertension. Hypertension was more common in people of upper socioeconomic class.

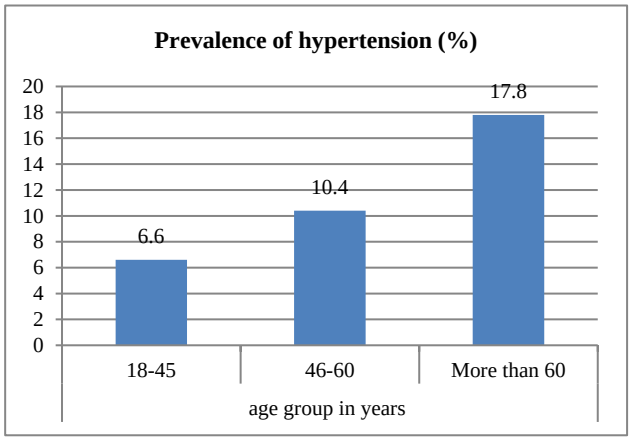


**Figure 1: Prevalence of hypertension in different age groups.**

Table 3 shows the risk factors associated with hypertension. As seen in the table, tobacco use in any form is strongly associated with hypertension. 17.6% of tobacco users were hypertensive as compared to 8.2% of non users. In this study alcohol use was not seen to be significantly associated with high blood pressure. Other factors significantly associated with hypertension were less physical activity, high BMI and increased salt intake. Prevalence of hypertension among inactive persons was 20.5% while in active people it was only 8.8%. People who were pre-obese and obese have high BP in 18.7% and 40% subjects respectively while in normal persons it was only in 8.1%. As far as salt intake is concerned, 28.6% of the respondents were having high BP who consumed more than 2 spoons of salt per day.

## DISCUSSION

India is a developing country and like other developing countries, it is going through a rapid demographic and epidemiological transition. Prevalence of hypertension is different in different parts of the country. The prevalence of hypertension in our study was found to be 10.33% which is less than that found by Singh et al in central India (17%).[15] Another study done by Ananthachari found much higher prevalence of hypertension i.e. 25.9% in rural Mandya, Karnataka.[16]

Almost all including our study revealed the prevalence of hypertension was increasing as the age increased.[17-19]

In our study a significant association was observed between hypertension and gender same as Kokiwar et al in their study which reported higher prevalence among females compared to males. Studies conducted by Bansal et al., among rural adults in Uttarakhand, Gupta et al, among rural adults in Haryana, Srinivas et al, in rural adult population of Andhra Pradesh reported higher prevalence of hypertension in males compared to females.[19-22]

As far as life style factors are concerned, a significant association was found in this study between hypertension and any form of tobacco use. Similar findings reported from study by Agarwal et al in a rural community in rural Pune other study.[23]

In our study no significant association was reported with hypertension and alcohol which is supported by similar findings by Kokiwar et al whereas a study by Kannan et al, among adults in rural Tamil Nadu reported significant association between alcohol consumption and hypertension.[20,24]

A study done by Gupta et al, on prevalence and predictors of essential hypertension in the rural population of Haryana, reported a similar findings as our study and observed a significant association between hypertension and salt intake. Whereas no significant association was reported from Kumar et al, in a study on prevalence of hypertension among rural and urban adults in Jaipur district.[22,25]

In our study there was significant association between hypertension and obese individuals based on BMI. Similar findings were reported from the study conducted by Bansal et al, among rural adults in Uttarakhand.[21]

## CONCLUSION

Prevalence of hypertension varies in different part of the country and various factors like increase in age, obesity and use of tobacco were observed to be associated with occurrence of hypertension. Majority of the hypertensive subjects remain undetected and therefore unaware of the risks they face. This points to the need for greater awareness of hypertension in the general population of rural areas. Strategies should be identified to diagnose hypertension as early as possible.

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