

Prevalence of Hypertension Amongst Adult Patients Attending Out Patient Department of Urban Health Training Centre, Department of Community Medicine, Era's Lucknow Medical College and Hospital, Lucknow

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ABSTRACT

Background: Hypertension is the most common disorder which is encountered in outdoor patients. The existing data suggests that there is an increase in the prevalence of pre-hypertension and hypertension in India. The prevalence of hypertension will increase even further, unless broad and effective preventive measures are implemented. The main objective of this study was to find out the prevalence of hypertension amongst the adult outdoor patients of an urban health centre of Lucknow district.

Materials and Methods: This observational, Out Patients Department based study involved a survey on 306 male and 1203 female respondents who were aged 18 years, who attended the Urban Health Training Centre of the Department of Community Medicine, Era's Lucknow Medical College and Hospital, Lucknow,

India. A structured, pretested schedule was used to collect the data with regards to the demographic characteristics and the blood pressure pattern. The Chi-square test and ANOVA were used to analyze the data.

Results: The prevalence of hypertension was found to be 44.46%. The proportion of hypertension showed an increasing trend with age. The mean systolic as well as diastolic blood pressure patterns were found to be higher, with an increase in age.

Conclusion: Hypertension was found to be highly prevalent among the outdoor patients of an urban health centre of Lucknow. An early detection of hypertension can be facilitated by periodically screening people regularly.

Key Words: Prevalence, Hypertension, Urban adults

BACKGROUND

The burden of the chronic Non-Communicable Diseases (NCD), especially heart disease, stroke, hypertension, diabetes, cancer and chronic respiratory disease, is rising in the low and the middle-income countries, particularly in Asia [1]. Hypertension is the most common disorder which is being encountered in the outdoor patients [2]. It is an established major risk factor and a leading cause of cardiovascular diseases worldwide. The prevalence of hypertension and its complications are increasing in the developing countries [3]. Cardiovascular diseases will be the largest cause of death and disability in India by 2020 [4]. The economic development, changes in the lifestyle and diet, and an increase in the life expectancy may be attributed to this rapid increase. Hypertension is an iceberg disease. The percentages of the awareness, treatment, and the control of hypertension are unacceptably low in the Indian adult population, as was indicated from a plethora of studies [5-8].

Thus, hypertension is emerging as a major health problem. The prevalence of hypertension has increased more among the urban communities than among the rural people. The prevalence of hypertension will increase even further, unless broad and effective preventive measures are implemented. Prevention programmes and policies are in their infancy in India. Epidemiological studies are urgently needed to assess the prevalence of hypertension,

to determine the baseline, against which the future trends in the risk factor levels can be assessed and preventive strategies can be planned to promote health among the populations.

The literature on the prevalence of hypertension in north India, more specifically in Lucknow, was scarce and thereby, the present study was undertaken to provide the data on the prevalence of hypertension amongst urban adults who were aged 18 years and above, who attended the OutPatients Department of the Urban Health Training Centre, Department of Community Medicine, Era's Lucknow Medical College and Hospital, Lucknow, India.

MATERIALS AND METHOD

The Study Design and the Participants

This six months, observational, Out Patients Department based study was carried out amongst adults who were aged 18 years and above, who attended the Urban Health Training Centre of the Department of Community Medicine, Era's Lucknow Medical College and Hospital, Lucknow, India. This urban health centre caters to a huge urban population of the old Lucknow city. Demographically, the population which resides in the mohallas of old Lucknow city, have people of different religions, socioeconomic statuses and other different characteristics.

Data Collection

This study was conducted between 1st October 2010 and 31st March 2011. A total of 1509 individuals (306 males, 1203 females) gave their consent and participated in the study. A structured, pretested schedule was used to collect the data with regards to the socio-demographic characteristics (age, gender, religion and the socioeconomic status) and the blood pressure pattern. The modified Prasad's classification was applied to measure the individual's socioeconomic status [9].

Two measurements of the blood pressure of each study participant were made 30 minutes apart, with the participants in the sitting position, by using a mercury column sphygmomanometer. The blood pressure measurements were made on the subject's left arm by using a cuff of the appropriate size, at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which the radial pulse disappeared and then it was deflated slowly at the rate of about 2mm per sec. The readings were recorded to the nearest 2 mm Hg.

In the cases where the two readings differed by over 10 mm of Hg, a third reading was obtained, and the three measurements were averaged. The pressures at which the sound appeared and disappeared, were taken as the Systolic Blood Pressure (SBP) and the Diastolic Blood Pressure (DBP) respectively. The measurements were taken by the first and second authors themselves.

The blood pressure was graded as normal (SBP <120 and DBP <80 mmHg), pre-hypertension (SBP = 120-139 and/or DBP = 80-89 mmHg), stage I hypertension (SBP = 140-159 and/or DBP = 90-99 mmHg), and stage II hypertension (SBP > 160 and/or DBP > 100 mmHg), as per the US Seventh Joint National Committee on the Detection, Evaluation and the Treatment of Hypertension (JNC VII) criteria [10].

Hypertension was diagnosed when the systolic BP was ≥ 140 mmHg and/or the mean diastolic BP was ≥ 90 mmHg, or when a person had a history of an anti hypertensive treatment, fifteen days before the survey was done. Isolated systolic hypertension was defined as a systolic BP of ≥ 140 mmHg and a diastolic BP of < 90mmHg.

Inclusion Criteria

All the adults who were aged 18 years and above, who attended the Urban Health Training Centre of the Department of Community Medicine, Era's Lucknow Medical College and Hospital, Lucknow, India.

Exclusion Criteria

All the participants who were aged less than 18 years of age were excluded from the study. The patients who were non cooperative and those who refused to provide the necessary information were also excluded.

Outcome Variables

The systolic and the diastolic blood pressures were used as the dependant variables.

Explanatory Variables

The age, gender, religion and the socioeconomic status were used as the explanatory variables.

Ethical Committee Approval

An ethical approval for the study was obtained from the institutional ethical committee.

Data management and Statistical Analysis

The data entry and the statistical analysis were performed by using Microsoft Excel and the Statistical Package of Social Sciences (SPSS), Windows version 14.0 software. The tests of significance like the Pearson's Chi-square test, the Student's t test and ANOVA were applied to find out the results. A two tailed p value of < 0.05 was taken as suggestive of a statistical significance. A multiple logistic regression analysis was done. The odds ratios with 95% confidence intervals were calculated to assess the association between the independent variables and hypertension.

RESULTS

[Table/Fig-1] shows the distribution of the respondents according to their blood pressures, which were measured as per the JNC-VII criteria report. Nearly 29.3% respondents were found to be pre-hypertensive, while 6.4% and 18.0% respondents were in the stages I and II of the hypertension respectively. Overall, 44.46% respondents were found to be hypertensive.

| Gender | Normal | Pre Hypertension | Stage I Hypertension | Stage II Hypertension |
|-----------------|-------------|------------------|----------------------|-----------------------|
| | No. (%) | No. (%) | No. (%) | No. (%) |
| Male (n=306) | 81 (5.4%) | 95 (6.3%) | 81 (5.4%) | 49 (3.2%) |
| Female (n=1203) | 315 (20.9%) | 347 (23.0%) | 318 (21.1%) | 223 (14.8%) |
| Total (n=1509) | 396 (26.2%) | 442 (29.3%) | 399 (26.4%) | 272 (18.0%) |
| Chi-Square (df) | 1.273(3) | | | |
| P-value | .735 | | | |

[Table/Fig-1]: Gender wise distribution of respondents according to their blood pressures measured as per JNC-VII criteria report

[Table/Fig-2] shows the age wise distribution of the individuals who were identified with hypertension. The overall, mean blood pressures were $130.06 \pm 21.29/81.66 \pm 12.11$ mm Hg respectively. One hundred and twenty nine of the 1509 (8.5%) individuals had isolated systolic hypertension. The proportion of hypertension showed an increasing trend with age. Seventy (27.55%) of the 254 individuals who were aged between 18-30 years were found to be hypertensive, while 79 (54.10%) of the 146 individuals who were aged above 60 years were found to be hypertensive. Significant differences (p-value < 0.05) were observed in the mean blood pressures (both the mean SBP and the mean DBP) among the various age groups, being lowest in the age group of 18-30 years ($121.15 \pm 18.05/ 79.51 \pm 10.64$) and highest in the age group of 51-60 years ($137.01 \pm 21.48/ 82.56 \pm 12.52$). These showed an increasing trend with age.

[Table/Fig-3] shows the distribution of the hypertensives according to their mean systolic blood pressures and diastolic blood pressures. One hundred and thirty (42.48%) of the 306 males and 541 (44.97%) of the 1203 females who were studied, were found to be hypertensive respectively. Though in females, the proportion of hypertension (44.97%) was found to be slightly higher compared to that in males (42.48%), the difference was not statistically significant. The mean SBP and DBP which were observed in men was $129.66 \pm 18.38/81.58 \pm 10.58$ mm Hg and in women, they were $130.16 \pm 21.97/81.68 \pm 12.48$ mmHg respectively, the difference being statistically insignificant (p-value > .05).

| Age group (years) | No. | No. of hypertensives (%) | Mean SBP mmHg | | Mean DBP mmHg | |
|---|---------------|--------------------------|---------------|----------------|---------------|-------|
| | | | Mean | ± SD | Mean | ± SD |
| 18-30 | 254 | 70 (27.55%) | 121.15 | 18.05 | 79.51 | 10.64 |
| 31-40 | 470 | 181 (38.51%) | 126.39 | 19.30 | 81.71 | 11.52 |
| 41-50 | 319 | 158 (49.52%) | 133.29 | 23.07 | 82.99 | 13.87 |
| 51-60 | 320 | 183 (57.18%) | 137.01 | 21.48 | 82.56 | 12.52 |
| >60 | 146 | 79 (54.10%) | 135.11 | 20.49 | 80.34 | 10.79 |
| Total | 1509 | 671 (44.46%) | 130.06 | 21.29 | 81.66 | 12.11 |
| F -value | | | 29.045 | | 3.862 | |
| P-value | | | 0.000 | | 0.004 | |
| Fisher's LSD Test SBP Mean difference (p value) | | | | | | |
| Age Groups | 18-30 | 31-40 | 41-50 | 51-60 | >60 | |
| 18-30 | - | -5.24 (0.001) | -12.14(0.000) | -15.86 (0.000) | -13.96(0.000) | |
| 31-40 | 5.24 (0.001) | - | -6.90 (0.000) | -10.63 (0.000) | -8.72(0.000) | |
| 41-50 | 12.14(0.000) | 6.90(0.000) | - | -3.72(.022) | -1.82(.376) | |
| 51-60 | 15.86 (0.000) | 10.63 (0.000) | 3.72(.022) | - | 1.90 (.354) | |
| >60 | 13.96(0.000) | 8.72(0.000) | 1.82(.376) | -1.90 (.354) | - | |
| DBP Mean difference (p value) | | | | | | |
| Age Groups | 18-30 | 31-40 | 41-50 | 51-60 | >60 | |
| 18-30 | - | -2.05(0.030) | -3.32 (0.001) | -2.89 (0.005) | -.67(0.592) | |
| 31-40 | 2.05(0.030) | - | -1.28 (.146) | -.84(.335) | 1.37 (.231) | |
| 41-50 | 3.32 (0.001) | 1.28 (.146) | - | .43(.652) | 1.37 (.231) | |
| 51-60 | 2.89 (0.005) | .84(.335) | -.43(.652) | - | 2.22 (.067) | |
| >60 | .67(0.592) | -1.37 (.231) | -2.65(.029) | - 2.22 (.067) | - | |

[Table/Fig-2]: Age wise distribution of individuals identified with hypertension

| Gender | No. Studied | No. of hypertensives (%) | Mean SBP mmHg | | Mean DBP mmHg | |
|---------|-------------|--------------------------|---------------|-------|---------------|-------|
| | | | Mean | ± SD | Mean | ± SD |
| Males | 306 | 130 (42.48%) | 129.66 | 18.38 | 81.58 | 10.58 |
| Females | 1203 | 541 (44.97%) | 130.16 | 21.97 | 81.68 | 12.48 |
| Total | 1509 | 671 (44.46%) | 130.06 | 21.29 | 81.66 | 12.11 |
| t-value | | | 0.411 | | 0.151 | |
| P-value | | | 0.681 | | 0.880 | |

[Table/Fig-3]: Distribution of hypertensives according to their mean systolic blood pressure and diastolic blood pressure

| Socio demographic Characteristics | Total (n=1509) | | Chi-Square(df), P-value |
|--|----------------|----------------------|-------------------------|
| | No. Studied | No. of Hypertensives | |
| Religion | | | .201(1), .654 |
| Hindus | 200 | 86 (43.0%) | |
| Muslims | 1309 | 585 (44.7%) | |
| Socio-economic class (Applying modified Prasad's classification) | | | 3.116 (4), .539 |
| Upper class | 3 | 1 (33.3%) | |
| Upper-middle | 18 | 10 (55.5%) | |
| Middle class | 75 | 36 (48.0%) | |
| Lower-middle | 506 | 212 (41.8) | |
| Lower class | 907 | 412 (45.4%) | |

[Table/Fig-4]: Hypertension in relation to religion and socioeconomic status

| Predictor | β coeff | Odd's ratio | 95%CI | P-value |
|--|---------|-------------|-------------|---------|
| Age (<40 yrs=1, >40yrs=2) | -0.763 | .466 | .379-.574 | 0.000 |
| Gender (Male=1, Female=2) | -0.145 | .865 | .668-1.121 | 0.865 |
| Religion (Hindu=1, Muslim=2) | -0.189 | .828 | 0.609-1.126 | 0.828 |
| Socioeconomic status (Low=1, Better off=2) | 0.407 | 1.503 | 0.624-3.618 | 1.503 |

[Table/Fig-5]: Multivariate logistic regression analysis of predictors of hypertension in the total study sample

to the religion and the socioeconomic status. A higher prevalence of hypertension was found among Muslims (44.7%) as compared to that among Hindus (43.0%) (P-value >.05). Also, a higher proportion of hypertension was found among the upper (33.3%), the upper-middle (55.5%) and the middle classes (48.0%), as

compared to that among the lower-middle (41.8%) and the lower (45.4%) classes (p-value >.05).

[Table/Fig-5] shows the multiple logistic regression analysis which was done by using hypertension as the dependent variable and the socio-demographic characteristics risk factors as the independent variables. Age was found to be a significant predictor of hypertension in the study population.

DISCUSSION

Distribution of the Respondents According to Their Blood Pressure Patterns

The prevalence of hypertension ranged from 5-15% between 1960-1990 [11]. It had increased to 20-36% in the past decade [12]. The factors which were attributable to this rising trend were the rapid urbanization, lifestyle changes, dietary changes and the increased life expectancy. The high prevalence of hypertension (44.46%) in the current study, confirmed this increasing trend. A compatible prevalence of hypertension was reported (46%) in a study which was conducted among the outdoor patients of an urban health centre of Kolkata [13].

The high prevalences of hypertension (44.46%) and prehypertension (29.3%) in the present study were similar to the trends which had been reported worldwide [14]. A similar prevalence of pre-hypertension (28.5 per cent) had also been reported in the study which was done by Yadav et al., which was carried out on an adult population of the urban areas of Lucknow, India [15].

Our study revealed that 8.5% individuals had isolated systolic hypertension. In a recent cross-sectional study which was conducted on the adult urban population of Lucknow, India the prevalence of isolated systolic hypertension was reported to be 6.2% [16].

Age wise Distribution of the Hypertensives

The proportion of hypertension, as well as the mean systolic and diastolic blood pressures, were found to increase steadily with an increase in age. These findings were coherent with those which had been reported in the studies which were conducted among the urban adults of Mumbai [17] and Lucknow [15]. Such changes of blood pressure with age, might be due to the changes in the vascular system. Cross-sectional surveys, as well as prospective observational cohort studies, have consistently demonstrated a positive relation between the age and blood pressure in most of the populations, with diverse geographical, cultural and socioeconomic characteristics [18].

Gender wise Distribution of the Hypertensives

The proportion of hypertension was slightly higher among females (44.97%) as compared to that in males (42.48%) but the difference was not statistically significant. Comparable observations (48.4% in females and 47.5% in males) were reported among the urban adults of Mumbai [17]. A female preponderance was also observed by Kabir et al., among the outdoor patients of Dhaka Medical College [19]. In contrast, a greater proportion of hypertension was observed among males (42.9%) as compared to females (34.2%), among the urban adults of Lucknow, India [15].

Hypertension with Respect to the Socioeconomic Status

A higher proportion of hypertension was found among the upper

(33.3%), upper-middle (55.5%) and the middle classes (48.0%), as compared to that among the lower-middle (41.8%) and the lower (45.4%) classes. According to the WHO [18], societies that are in the transitional stages of economic and epidemiological changes, have higher prevalences of hypertension among the upper socioeconomic groups.

LIMITATION

A major limitation of this study was that the blood pressure pattern estimates were based on the measurements of the blood pressure on a single day and were not repeated again for practical reasons. Also, the subjects for the study were chosen from the Out Patients Department and thus they may not have been the representatives of the entire Lucknow. However, our study areas had a representative mix of subjects, with all the different age groups, religions and socioeconomic classes. Further, the reason for their health seeking was not analyzed, as it was a confounding factor in this study. The history of the inter current medications in the study population (OCP, anticonvulsants, etc) were also not considered.

CONCLUSION

Hypertension was found to be highly prevalent among the outdoor patients of an urban health centre of Lucknow. This study projects the need of an early detection of hypertension, which can be facilitated by a periodic screening of the people, regularly at the hospital as well as at the community levels.

What this Study Adds

A regular, periodic screening of the people, especially of the outdoor patients, at the hospital as well as at the community level, is required for an early detection and treatment of the hypertension.

The Future Scope of This Study

A larger multicentric study can be conducted at different hospitals to know the trends of the increasing blood pressure among the outdoor patients.

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