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Awareness, treatment, and control of hypertension among adult population in a rural community of Singur block, Hooghly District, West Bengal

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Abstract:

BACKGROUND: Hypertension is an important treatable public health problem both globally and in India with an increasing prevalence significantly in both urban and rural population. It is one of the leading causes of adult mortality and morbidity, but poorly controlled hypertension remains a major health problem.

OBJECTIVE: The objective of this study was to find out awareness, treatment, and control of hypertension among study population and association of hypertension awareness with sociodemographic factors, if any.

MATERIALS AND METHODS: This study was conducted from May 2013 to April 2014 in the rural community of Singur block, West Bengal. Data were collected with respect to sociodemographic characteristics as well as records related to hypertension such as awareness, treatment, and control of hypertension. Blood pressure (BP) measurement of individuals aged 20 years and above of both sexes was done. Pearson's Chi-square test was performed to find out the association between the categorical variables. SPSS 19.00 software was used for analysis.

RESULTS: Nearly 48.2% of the participants were aware of their elevated BP; 47.1% of the participants were taking pharmacological treatment, mostly allopathic and only 8.8% had their BP under control. A statistically significant association was found between age, education, and socioeconomic status (per capita income) with awareness of hypertension.

CONCLUSION: Lack of awareness of the disease and very low rate of control of hypertension among those who were treated became the major issues. These findings emphasize the need for dissemination of knowledge about the disease and counseling of the patients during treatment continuation.

Keywords:

Adults, blood pressure, counseling, hypertension, India, rural population

Introduction

Hypertension is an important public health challenge worldwide because of its high prevalence and concomitant risks of cardiovascular and kidney diseases.^[1] The prevalence of hypertension has increased by 30 times among the urban

population over a period of 55 years and about 10 times among the rural population over a period of 36 years in India.^[2] If hypertension is detected early, it is possible to minimize the risk of cardiovascular diseases, stroke, and kidney failure.^[3] The increasing trend of hypertension is very soon going to be built up as a colossal problem not only in the urban areas of

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India but also in the rural areas, which might be due to lack of awareness, treatment, and control.^[4,5]

Studies suggested low levels of knowledge on hypertension among patients^[6,7] and lack of correct information and improper understanding of hypertension not only in rural areas, but also widely reported in urban environments and industrial countries.^[8] Rates reported for hypertension control were disappointing,^[9] which were suggested to be 13%–56% around the world.^[6] However, the awareness among the hypertensive patients is still low in Indian subcontinent may be because of lower literacy, inappropriate perception of medical advice, irregular sources of health-related information, or inadequate counseling regarding hypertension due to skewed doctor-patient ratios in government-run hospitals.^[10]

Therefore, a comprehensive strategy for reduction in hypertensive morbidity should include prevention strategies such as increased awareness, early detection, adequate treatment, and strict control of blood pressure (BP).^[11] There are no robust, appropriate, and organized health education programs either at individual or community level to overcome the lack of awareness of the basics of prevention and control of hypertension and its risk factors among the general mass. With this backdrop, the study was undertaken to find out awareness, treatment, and control of hypertension among the study participants and to find out the association between awareness of hypertension with sociodemographic factors, if any.

Materials and Methods

This community-based, observational, epidemiological study having cross-sectional design was conducted among people aged 20 years and above, for 1 year starting from May 2013 to April 2014 in a rural community of Singur block, Hooghly district of West Bengal, which is the rural field practice area of the All India Institute of Hygiene and Public Health (AIIPH&PH), Kolkata.

Sample size

Sample size was calculated with a previous prevalence of hypertension (19.04%)^[5] and taking 20% relative allowable error and it came out to be 409 after applying the following formula: $Z_{\alpha}^2 pq/L^2$, where $Z_{\alpha} = 1.96$, which is the standard normal deviate at a desired confidence level (95%); P = previous prevalence; $q = 100 - p$; and L = allowable error. Since multistage random sampling technique was followed, a “design effect” of 1.5^[12] and also an additional 5% increase in the sample size were required to compensate for any nonresponse among the study participants. Hence, the calculated sample size came as 645 and finally 651 individuals were covered for the study.

Sampling technique

Two-stage random sampling method was followed for the selection of study participants. In the first stage, out of 64 villages of the study area, 20% were selected randomly; i.e., the primary sampling units were villages. In the second stage, from the selected villages, the required number of adult individuals was selected randomly. Therefore, the final sampling units were the persons aged ≥ 20 years. All the inhabitants aged 20 years and above were included in the study, after excluding unwilling individuals, pregnant women, and seriously ill patients.

Data collection

The study participants were interviewed at their family setting with the help of predesigned and pretested schedule after explaining the academic nature of this research and they were assured that information collected from them would be kept confidential and would be used only for research purpose. Each participant was examined for BP (using JNC 7 guidelines).^[13] During the study, individuals with BP level $>140/90$ mmHg were advised to visit the nearest union health centers for further investigations and treatment.

Ethical clearance

Data collection was initiated only after receiving the Ethical Clearance Certificate from the Institutional Ethics Committee on December 20, 2012 (AIIPH and PH, Kolkata - 700073). Informed written consent in the local language was taken from every interviewee.

Operational definition

1. Hypertension: Systolic BP (SBP) ≥ 140 mmHg and/or diastolic BP (DBP) ≥ 90 mmHg and or presently under treatment with antihypertensive medicines^[13]
2. Awareness: Participants’ report of a prior diagnosis of hypertension (or high BP) made by a health professional^[14]
3. Treatment: Current use of prescribed medication for lowering elevated BP among hypertensive patients in our sample was considered as the treatment of hypertension; we considered only pharmacological treatment, including allopathic or any alternative medicine medications^[15]
4. Control: With pharmacological treatment, SBP <140 mmHg and DBP <90 mmHg.^[15]

Statistical analysis

The collected data were entered in Microsoft Excel worksheet (Microsoft, Redwoods, WA, USA) and checked for accuracy. After entering the data, they were checked for any duplicate or erroneous entry. The significance of association between awareness with the independent variables was analyzed by Pearson’s Chi-square (χ^2) test. $P < 0.05$ was considered statistically

significant. All the statistical analyses were done using SPSS software, version 19.0 (Statistical Package for the Social Sciences Inc., Chicago, IL, USA).

Results

The present study showed that majority (32.9%) of the study population belonged to 20–30 years' age group and only 8.3% were in the age group of 60 years and above (mean age 38.4 ± 14.3 years); 47.2% were male and 52.8% were female. Most of the respondents (94.2%) belonged to the Hindu religion and 54.2% were from nuclear family. Among them, 79.9% were currently married followed by 16% who were never married. Nearly 30% had a literacy status up to primary school completion followed by 23.2% middle school completion and 16.3% were illiterate. Around 74.7% of the participants were sedentary workers and the rest (25.3%) were moderate workers as per the "Classification of activities based on occupations" by the National Institute of Nutrition.^[16] By occupation, 42.4% of the study population were homemaker and 15.8% were farmers. Nearly half (47%) belonged to Class IV socioeconomic category followed by 45.3% in Class V socioeconomic category as per the modified B.G. Prasad's scale 2013.^[17] Among hypertensive participants (170, i.e., 26.1%), 82 (48.2%) were already known hypertensive, i.e., aware of having hypertension, while 88 (51.8%) participants were newly diagnosed hypertensive by the researcher.

Eighty-two out of the 170 hypertensive participants (48.2%) were aware of their elevated BP; 80 (47.1%) participants (male 44.8% and female 48.5%) were taking pharmacological treatment for the condition, mostly allopathic. However, only 15 (18.7%) participants out of those 80 who were under treatment had their BP under control; where males outnumbered females (23.3% vs. 16.0%). This proportion is coming down to 8.8% when compared out of the total hypertensive participants (15/170) [Table 1].

Participants aged 37 years or above, females, belonging to Muslim community and SC/ST community, educated above primary level, of sedentary occupation, of joint family, with per capita income >833 rupees, and having a positive family history had more awareness compared to their respective counterparts. A statistically significant ($P < 0.05$) association was found with age,

religion, caste, marital status, education, type of family, and having a family history of hypertension by Pearson's Chi-square test [Table 2].

Discussion

In this cross-sectional study, we aimed to assess awareness, treatment, and control of hypertension among the rural population of Bengal. Nearly half (48.2%) of the participants were aware of hypertension; 47.1% were taking treatment and only 15 (18.7%) among them had controlled BP which was 8.8% when compared out of the total hypertensives (15/170). Competing health priorities (such as the existing burden of maternal and child health, communicable diseases) and scarce health resources affect the availability, accessibility, and affordability of public and private health services. Furthermore, a combination of socioeconomic factors (increased dependence, burden of drug costs), attitudes toward regular medicine intake, and a low level of overall education possibly contributed to the low level of awareness, treatment, and control of hypertension in our study sample. Awareness of participants regarding hypertension was found to have statistically significant ($P < 0.05$) relation with age 37 years or above, females, Muslim community, SC/ST community, education above primary level, sedentary occupation, joint family, per capita income >833 rupees, and a positive family history of hypertension.

Sathish Kumar *et al.*^[18] in Manipur showed that though hypertension was highly prevalent awareness was poor (42.5%); treatment and control were 30.8% and 11.4%, respectively. In the present study, awareness and treatment were more, but control was less than that of the study done by Sathish Kumar *et al.*^[18] Zinat Motlagh *et al.*^[19] in Iran showed that treatment rates were higher in females (75.5%) and lower in males (37.7%), but control rates were higher in both males (30.7%) and females (31.4%) than that of the present study. Habitat, education, income, family history with hypertension, smoking, and time of diagnosis to the disease were found to be related to the treatment of the disease.

Wang *et al.*^[15] in a study in China showed that the awareness, treatment, and control rates among all hypertensive participants were 42.6%, 34.1%, and 9.3%, respectively, and control rate among the treated

Table 1: Awareness, treatment, and adequacy of control of hypertension among hypertensive study sample (n=170)

| Hypertensive | Category | | | Treated cases/total controlled, n (%) |
|----------------|--------------|----------------|-------------------|---------------------------------------|
| | Aware, n (%) | Treated, n (%) | Controlled, n (%) | |
| Total (n=170) | 82 (48.2) | 80 (47.1) | 15 (8.8) | 15/80 (18.8) |
| Male (n=67) | 31 (46.3) | 30 (44.8) | 7 (10.5) | 7/30 (23.3) |
| Female (n=103) | 51 (49.5) | 50 (48.5) | 8 (7.8) | 8/50 (16.0) |

Table 2: Awareness of hypertension in relation to different sociodemographic characteristics (n=651)

| Sociodemographic characteristics | Awareness | | Total, n (%) | Significance |
|----------------------------------|------------|------------|--------------|--------------------|
| | Yes, n (%) | No, n (%) | | |
| Age (years) | | | | |
| <37 | 3 (0.9) | 322 (99.1) | 325 (100.0) | 80.323, $P < 0.05$ |
| ≥37 | 79 (24.2) | 247 (75.8) | 326 (100.0) | |
| Gender | | | | |
| Male | 31 (10.1) | 276 (89.9) | 307 (100.0) | 3.294, $P > 0.05$ |
| Female | 51 (14.8) | 293 (85.2) | 344 (100.0) | |
| Religion | | | | |
| Hindu | 70 (11.4) | 544 (88.6) | 614 (100.0) | 14.021, $P < 0.05$ |
| Muslim | 12 (32.4) | 25 (67.6) | 37 (100.0) | |
| Caste | | | | |
| SC, ST | 41 (19.5) | 169 (80.5) | 210 (100.0) | 13.514, $P < 0.05$ |
| OBC, general | 41 (9.3) | 400 (90.7) | 441 (100.0) | |
| Marital status | | | | |
| Unmarried | 1 (1.0) | 103 (99.0) | 104 (100.0) | 15.218, $P < 0.05$ |
| Others | 81 (14.8) | 466 (85.2) | 547 (100.0) | |
| Education | | | | |
| Below and primary | 52 (15.6) | 281 (84.4) | 333 (100.0) | 5.646, $P < 0.05$ |
| Above primary | 30 (9.4) | 288 (90.6) | 318 (100.0) | |
| Occupation | | | | |
| Moderate | 26 (9.9) | 237 (90.1) | 263 (100.0) | 2.944, $P > 0.05$ |
| Sedentary | 56 (14.4) | 332 (85.6) | 388 (100.0) | |
| Type of family | | | | |
| Nuclear | 27 (7.6) | 326 (92.4) | 353 (100.0) | 17.144, $P < 0.05$ |
| Joint | 55 (18.5) | 243 (81.5) | 298 (100.0) | |
| Socioeconomic status | | | | |
| PCI ≤833 | 37 (11.5) | 285 (88.5) | 322 (100.0) | 0.707, $P > 0.05$ |
| PCI >833 | 45 (13.7) | 284 (86.3) | 329 (100.0) | |
| Family history | | | | |
| Yes | 32 (23.4) | 105 (76.6) | 137 (100.0) | 18.253, $P < 0.05$ |
| No | 50 (9.7) | 464 (90.3) | 514 (100.0) | |

PCI= Per capita income

participants was 27.4%, which is almost similar to the present study. The present study showed that the awareness, treatment, and control rates among all hypertensive participants were, respectively, higher than those of Bhardwaj *et al.*^[4] and Yuvaraj *et al.*,^[20] but lower than those of Polonia *et al.* in Portugal^[21] and Yip *et al.*^[22]

Gupta^[23] showed that middle-aged Asian Indian women had very low awareness, treatment, and control of hypertension. Although there was a high prevalence of awareness of hypertension (42.8%), it was higher in urban (56.8%) areas than rural areas (24.6%). Among hypertensive participants, treatment was noted in 18.3% (rural 13.1, urban 22.5) and control in 3.9% (rural 1.3, urban 5.9). A significant determinant of low awareness, treatment, and control was rural location (multivariate-adjusted $P < 0.05$ SPSS software, version 19.0 (Statistical Package for the Social Sciences Inc., Chicago, IL, USA).

Lee *et al.* in South Korea^[3] showed that awareness, treatment, and control of hypertension were 60.1%, 91.7%,

and 27.2%, respectively, more than the present study. In both sexes, age ≥60 years was positively associated with higher awareness, treatment, and control, whereas body mass index was positively (female) and negatively (male) associated with BP control. In women, family history of diabetes mellitus was positively associated with higher awareness and treatment, whereas low waist circumference was positively (male) and negatively (female) associated with BP control. In the present study, awareness was significantly ($P < 0.05$) related with age, religion, caste, marital status, education, type of family, and family history of hypertension in both sexes.

Mohan *et al.*^[24] in Chennai showed that among the total hypertensive patients (32.8%), 70.8% were under treatment and 45.9% had their BP under control (men more than women), which is lower than the current study. The results of the present study showed that compared to the Western population, there is a long way to go to accomplish the goal of optimal control among rural Indian population. It took at least 30–40 years of sustained effort to substantially improve hypertension

detection and control in Western countries and the rates are still far from optimal.^[16] It is therefore obvious that considerable effort is needed to prevent or reduce the increasingly large burden of disease related to increasing rates of hypertension in countries in epidemiological transition, such as India. The “rule of halves” for hypertension states that: “half the people with high blood pressure are not known, half of those known are not treated and half of those treated are not controlled.” If this rule is valid, then only one in eight of the hypertensive population would be receiving optimal treatment. An attempt was made to assess the applicability of the rule of halves in the rural Indian population in this study. The present study showed little improvement in detection, treatment, and control of hypertension compared to earlier studies in rural India.^[25]

Limitations

In this community-based study, we had interviewed participants and their BP was recorded for single time. As the data collection period was 12 months covering all the seasons of the year, there might be some error due to seasonal variation of BP. Again, BP was recorded at individual household level during daytime, so normal diurnal variation of BP could not be assessed. An overwhelming 80% of the respondents had no idea about the history of hypertension, diabetes mellitus, etc., in the family. Quality of this information has its inherent weakness. Being a cross-sectional study, the possibility of recall bias could not be ruled out regarding awareness, treatment (regularity of medication), and control of hypertension.

Conclusion and Recommendations

In this community-based study, we observed that awareness, treatment, and control rates of hypertension were low. Public health programs and practical strategies are required to improve prevention, management, and control of hypertension in the community. Newer ideas in hypertension education such as involvement of mass media may be tried as in case of vaccines. The health workers have to play a part by educating the people and also themselves being an example. In particular, attention should be given to the elderly, obese, and those with a family history of hypertension, while raising awareness and treatment among younger adults. It is also recommended that regular BP checkup should be done among the community for early detection of hypertension and to prevent complications. These findings emphasize the need for dissemination of knowledge about the disease and counseling of the patients during treatment continuation.

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Conflicts of interest

There are no conflicts of interest.

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