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Research Article

Implications of Public Healthcare Structure on Diagnosis and Management of Hypertension in Rural India

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Abstract

Objectives: To find out implications of the healthcare structure on diagnosis and management of hypertension in rural India.

Methods: A door to door survey with a questionnaire and measurement of blood pressure (BP) in adults. Villages were classified as "hospital" and "no Hospital" on basis of availability of a public healthcare facility. Villages from districts of Maharashtra state of India were included. India has three tier system of public health delivery which includes, Primary Health Centre (PHC), Community health centers (CHC).

Results: n = 7325. Villages = 23, Districts = 2. Eighteen (75%) villages had "no public health facility", there were 3 PHCs and 2 CHCs. Population in PHC and CHC were included in "Health facility (HF)" group. Population in "no health facility (NHF)" group was 40.75%. Prevalence of hypertension was nearly similar irrespective of presence or absence of healthcare facility 29.77 and 28.46 respectively (mean = 29.5%). 72.44% population never checked their BP in villages in HF group. Only 17.57% population ever checked BP in villages with NHF. The prevalence of uncontrolled hypertensive's was 48.09% in villages with NHF as compared to villages with HF (46.09%). Women had more chances of getting BP measured and had more prevalence of hypertension than men. Men had half the chances of getting diagnosed with hypertension than women in villages with "no health facility" group.

Conclusion: Our study shows major number of population is yet to get BP checked first ever in their life. The basic healthcare is not provided in all villages. Hypertensive's in villages with health facility had more BP controlled than in villages with no facility. Probably, measures by government under various programs like ante natal checkups are causing a beneficial effect on women while screening for hypertension during their pregnancies. Male population needs to aware for checking the BP and should be promoted to do it. Significant difference exists in control of BP. Patients initiated and maintained on medications too has significant differences with respect to availability of health facility.

Keywords: *Epidemiology; Rural India; Hypertension; Public Health Structure*

Introduction

Hypertension is one of the most important risk factors for cardiovascular diseases (CVDs) globally [1]. Complications to hypertension account to 9.4 million death every year and contribute to 45% of deaths due to heart disease and 51% of deaths due to stroke [2]. High systolic blood pressure continues to remain the leading risk factors for Disability Adjusted Life Years (DALYs) in 2017 [3]. However, as compared to high-income countries the burden of hypertension is disproportionately high among low and middle-income countries such as India [4,6]. It is estimated that 28% of mortality in India is due to cardiovascular disease, making it the leading cause of deaths [6].

Prevalence of hypertension is 31.8% in India [4]. Likewise, the global burden of disease study reported that 1.63 million deaths occurred in India due to hypertension accounting for 39 million DALYs as compared to 0.78 million deaths and 21 million DALYs in 1990 [11]. There is also a discrepancy in the burden of hypertension between rural and urban population. A systematic review done for the studies from 1950 to 2013 showed that the prevalence of hypertension in urban areas in India was 33.8% (29.7 - 37.8) as compared to 27.6% (23.2 - 32.0) in rural India [12]. Over last 20 years the age and sex standardized prevalence of hypertension increased from 23.0% to 42.2% and 11.2% to 28.9% in urban and rural national capital region of Delhi, respectively [12]. Probably improved access to check blood pressure was attributing for the change in rates.

Despite the existence of effective preventive measures and blood pressure lowering drugs many people with hypertension go undetected and untreated in in India. It is mainly due to a lack of awareness about hypertension coupled with lack of blood pressure screening, treatment and control [4,5]. The situation is expected to be even worse in rural India where 70% of the population is living with poor health literacy and weaker health systems [14].

India has three tier system of public healthcare services [15]. Subcentre (SC), primary health centre (PHC), community health centre (CHC), district hospital (DH).

The sub-centre is the first contact point between the primary healthcare system and the community. A lady health worker also known as Accredited Social Health Activist (ASHA) is in charge of six sub-centre's each of which are provided with basic drugs for minor ailments and are expected to provide services in relation to maternal and child health, family welfare, nutrition, immunization, diarrhea control, and control of communicable diseases, however there is major lack of having manpower for screening and management of hypertension.

Primary Health Centers (PHCs) comprise the second tier in rural healthcare structure. State Governments establish and maintain PHCs. A medical officer is in charge of the PHC supported by fourteen paramedical and other staff. It acts as a referral unit for sub-centers. It has four to six beds for inpatients. The activities of PHC involve curative, preventive, and Family Welfare Services [16].

Community Health Centers (CHC) forms the uppermost tier of the system. Four medical specialists including Surgeon, Physician, Gynecologist, and Pediatrician supported by twenty-one paramedical and other staff serves each CHC.

Though there are predefined allocation of staffs across SC, PHC, CHC, human resource management remains to be poor and challenging. Manpower shortfall, absenteeism, skill full manpower remains to be unavailable most of the times [16].

Low quality of care, poor accountability, lack of awareness and limited access to facilities are the key challenges [17].

It is well known that rural communities do not have access to the same range of healthcare services as urban communities and that health status is poorer in rural areas [18].

There is huge difficulty in attracting and retaining doctors in rural areas. Studies suggest that resolving the health problems of rural communities will require more than simply increasing the quality and accessibility of health services [19]. In the current scenario, 75% of the qualified consulting doctor's practice in urban, 23% in semi-urban (towns) and only 2% in rural areas whereas the vast majority of population live in the rural areas.

Many a time rural patients bypass local rural hospitals despite the availability of comparable medical services. The general conditional logic analysis of data on patients and hospitals suggests that hospital characteristics (size, ownership, and distance) and patient characteristics (payment source, medical condition, age, and race) influence rural patients' decisions to bypass local rural hospitals [20].

The average area one PHC covers is 123 sqkm. The average radial distance covered by a PHC is 7 km. While PHC covers a population of 20000 to 30000, CHC caters 80000 to 120000 [21].

Aim of the Study

The main aim of current study is to find out any differences in diagnosis and management of hypertension in villages with and without public health facilities.

Methods

Study design and study area

An active and opportunistic cross-sectional survey of adults aged ≥ 18 years was carried out in of Latur and Osmanabad districts of Maharashtra state of India. Total 23 villages (Appendix 1). BP and simple characteristics were registered in 7,325 people in the screening.

Arani	Mohatarwadi	Vatwada
Bhandarwadi	Nitali	Jagji
Bukanwadi	Palsap	Khamgaon
Dakwadi	Panwadi	Kond
Dhorala	Sarola (Bhi)	Dhoki
Ghogrewadi	Ta-Kheda	Murud
Hinglajwadi	Vanewadi	Ter
Kolekarwadi	Padoli (na)	

Appendix 1: *Names of villages.*

Two groups was villages was defined - "HF"- health facility group where there is availability of a public health facility and "NHF" - No health facility group where public health facility is not available.

Screening tools and techniques

Door to door screening of blood pressure was done using structured questionnaire which included self-reported demographic information, smoking and alcohol consumption, history of BP measurement, hypertension, diabetes and related cardiovascular risk factors like dyslipidemia, personal and family history of cardiovascular disease.

Blood pressure was measured using standardized digital BP devices from either Omron. Depending on the health worker, blood Pressure measurements were done minimum two times and maximum three times ranging from 3 to 5 minutes apart, in sitting position either on chair or steps of the home. BP was measured in right upper arm. Average of last two readings or the available two readings was reported in the analyses.

Weight was measured using Omron digital machine and diamond aneroid scale and height was measured using measuring tape. Self-reported height and weight were used whenever measurement was not possible. Body mass index (BMI) was calculated using Kg/m^2 formula.

The 6 screeners health workers were well trained before starting the screening. They were trained to use digital Omron BP devices for measuring BP and digital and aneroid scale to measure height and weight. They were also trained on disseminating awareness on risk factors for development of hypertension, diabetes and cardiovascular diseases and complications of hypertension and diabetes.

Study variables/operational definition

Hypertension (raised BP) is defined as subjects with BP ≥ 140/90 mmHg and/or currently taking anti-hypertensive medication or given history of having hypertension. Treatment is defined subjects taking anti-hypertensive medicine at the time of interview. Control is defined as BP < 140/90 mmHg in subjects taking anti-hypertensive medicine.

Data analysis

Group-wise comparisons were performed with independent samples t-test, A two-sided P-value < 0.05 was considered statistically significant at 95% confidence interval. The statistical packages IBM SPSS Statistics 25 (IBM, Armonk, NY, USA) was used for all analyses.

Ethical consideration

Written informed consent was obtained from all the participants at the time of screening.

Results and Discussion

Out of 7,325 people screened in 23 villages in 2 districts, 2141 (29.22%) had hypertension. On average 70% of adult population of the village was screened. Eighteen (75%) villages had no public health facility. There were 5 villages with public health facilities. There were 3 PHCs and 2 CHCs. Average age was 46 years. Women were 53.26% while men were 46.62%.

In villages with public health facility 4310 people were screened, 1283 (29.77%) had hypertension. Out of 368 people who gave history of hypertension, 203 (55.16%) had controlled hypertension on with medication and or physical exercise. Among gender, 6.58% men gave history of hypertension 11.50% women gave history of hypertension. Among people who were asked if they have checked their BP anytime before, 75.20% people never checked BP before. Among 348 old hypertensive patients, 327 were on medical treatment (93.97%).

In villages without public health facility 3015 people were screened, 858 (28.46%) had hypertension. Out of 237 people who gave history of hypertension, 111 (46.86%) had controlled hypertension with medication and or physical exercise. Among gender, 6.67% men gave history of hypertension, 9.28% women gave history of hypertension. Among people who were asked if they have checked their BP anytime before, 83.52% people never checked BP before. Among 237 old hypertensive patients, 204 were on medical treatment (86.08%).

The average distance to reach nearest PHC was 9.75 km. Maximum distance to reach respective PHC was 22 km and minimum was 3 km. Women had double the chances of getting checked than men 14.09% vs 7.9% respectively ($p = < 0.0001$). There was no significant difference in prevalence of hypertension in HF and NHF groups ($p = 0.3819$). There was significant difference in people getting checked BP anytime in their life in HF and NHF group ($p = 0034$). There was no significant difference in hypertensive patients who were on treatment ($p=0.5$). There was very significant difference in patients who were not on treatments in spite of their known hypertensive status ($p= 0.0072$).

Conclusion

Even though there are actions from Indian Government for making public health facilities in rural areas more accessible and advanced, still there are existing problems in infrastructure, manpower etc. The average population and geographic areas covered under facilities impacts the healthcare delivery especially of hypertension. Being highly prevalent, asymptomatic and chronic condition, hypertension goes undetected and poorly treated.

Our study shows major number of population is yet to get BP checked first ever in their life in both areas. However, chances of getting checked for hypertension are more in areas where there is public health facility available in same village. Although prevalence of hypertension was same in both areas, their control of hypertension remains to be significantly better in areas where there was public health facility, this suggest having a public health facility in near vicinity benefits to control BP. In both areas women had more chances of getting BP measured, reason may be Government programs for antenatal check ups, still the number of women getting BP measured in areas with public health facilities were more than the other. This suggest even the antenatal programs are better implemented in places where there is public health facility.

Significant number of hypertensive patients in villages with no health facility were never initiated on medications and significant number of people were on irregular medications than hypertensive patients in areas with health facilities, this suggest that having health facility in the vicinity benefits patients to be on medications.

Having a public health facility in the near vicinity or village or community will impact positively of hypertension and overall health as well.

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