A Cross-Sectional Study on Prevalence and Socio-Demographic Correlates of Hypertension in Peri-urban Community of Kashmir Valley

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Abstract:

Introduction: Hypertension, also known as high or raised blood pressure, is a global public health issue. It's among the top ten leading causes of death in the world. Poor compliance to anti-hypertensive therapy is usually associated with bad outcome of the disease and wastage of limited health care resources. **Objective :** To assess the prevalence, socio-demographic correlates and treatment compliance of the hypertensive patients. **Method:** This community based cross sectional study was conducted in a peri-urban area in the month of May 2019.This study was conducted in relation to May Measurement Month, an Initiative which was first observed by international Society of Hypertension in May 2017. This area is divided into six Mohallas from which two Mohallas were selected randomly. All households from the selected Mohallas were included in this house to house survey. A total of 1076 subjects above the age of 15 years participated in the study. The analysis of data was done using SPSS version 20.00 and standard statistical test like chi square (χ^2) was applied where ever required. **Results:** Over all prevalence of high blood pressure was found to be 28.8% in study population with 82.6% known hypertensives and 17.4% detected with raised BP for the first time. The overall compliance to treatment in known hypertensives was 34.4%. **Conclusion:** A very low treatment compliance level was observed in the study participants which needs redressal by way of mass awareness campaigns, as well as individual counseling for Behaviour Change Communication.

Key words: Cardiovascular Disease, Compliance, Hypertension, Treatment.

Introduction:

Currently, developing countries like India are in a transitional phase, an epidemiological transition from a phase of predominantly infectious disease burden to a phase of triple burden of infectious diseases, chronic non-communicable diseases, and injuries. This is largely due to demographic, lifestyle, nutritional and environmental changes.[1] According to World Health Organization (WHO) 2017 estimates on Non Communicable diseases (NCDs), NCDs were estimated to be responsible for about 61% of all deaths in India. High Blood Pressure (BP) is a major public health problem in developing countries around the world and is one of the most important modifiable risk factors for Cardio Vascular Diseases (CVDs).[2]

Hypertension significantly contributes to the burden of heart disease, stroke and kidney failure and premature mortality and disability. It disproportionately affects populations in low and

middle income countries where health systems are weak .The increasing prevalence of hypertension is attributed to population growth, ageing and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress.[3] Early diagnosis and treatment of hypertension as a secondary level of prevention forms an effective tool for preventing complications and thus reducing morbidity and mortality due to hypertension. This can be achieved by screening for early detection and use of effective medical therapies for management of hypertensives. It has been seen that poor adherence to antihypertensive therapy has proven to be one of the biggest obstacles in the control of high blood pressure. It also compromises the efforts of the health care system, policy makers and health care professionals in improving the health of populations.[4] Failure of compliance to treatment causes medical and psychological complications of the disease, reduces patients' quality of life, wastes health care resources and erodes public confidence in health systems. [5]

Hypertension is a disease which requires continuous self-management, such as life-long medicine treatment and lifestyle improvement. Treatment adherence can be defined as carrying out actions which corresponds to clinical treatment of specific diseases [6], which prevent injury from aggravation of symptoms and disease and help control patients' current situations, making a positive influence on patients' satisfaction of life. [7] Hence, in 2016 the International Society of Hypertension (ISH) announced its intention to initiate and lead a global campaign designed to raise awareness of the importance of BP and to act as a pragmatic temporary solution to the shortfall in BP screening programmes. This campaign, May Measurement Month (MMM) 2017, was designed to expand on and standardize the activities of the annual World Hypertension Day (17 May) which had been an international event since 2005. [8] The initial MMM survey took place in 2017 in 80 countries, screening over 1.2 million adults. [9]

The present community based study was an endeavor in this direction to implement the MMM strategy on a smaller scale in a peri-urban locality. This included screening people for hypertension and at the same time using this as an opportunity to create awareness about the disease as well as timely intervention in those needing further care.

Objectives:

(1) To assess the prevalence of hypertension in study population.

(2) To determine the socio-demographic factors associated with hypertension.

(3) To measure the compliance to medication among hypertensive patients in study population.

Method:

This community based cross sectional study was conducted in peri-urban area (Aanchar) of Soura near Sher-i-Kashmir Institute of Medical Sciences during May Measurement Month in 2019. This area is divided into six Mohallas from which two Mohallas were selected randomly. These two Mohallas have total population of 3876. All households from the selected Mohallas were included in this house to house survey. All volunteer participants above the age of 15 years were recruited. A total of 1076 subjects participated voluntarily in the study. The survey team included residents and sociologist from the department of Community Medicine, SKIMS, Soura. During survey, head of each family was contacted and written informed consent was obtained from head of each family as well as from the study participants. Necessary information was gathered with the help of predesigned questionnaire and blood pressure measurement was done by standard method of BP monitoring (in which patient should sit or lie comfortably, the arm should be fully supported on flat surface at heart level and for blood pressure measurement properly sized blood pressure cuff is used). Three readings were taken and a mean of the second and third readings gave accurate blood pressure. Newly detected participants with hypertension were given necessary advice with regard to life style modification and need

for treatment on case to case basis. Modified BG Prasad's classification was used for assessing Socio-economic status.

Inclusion criteria: Persons aged 15 years & above, those on anti-hypertensive treatment for more than six months and those who gave informed consent.

Exclusion criteria: persons with severe chronic illness, pregnant & lactating women and those who did not give consent for the study were excluded.

Data Collection: After obtaining informed consent, subjects were personally interviewed with a predesigned pretested questionnaire. The questionnaire included questions pertaining to socio-demographic characteristics and adherence to treatment.

Statistical analysis: The standard statistical chi square (X^2) test was applied where ever required. All the results obtained have been discussed on 5% level of significance and p value of < 0.05 has been considered significant. The analysis of the data was done using SPSS version 20.00, Chicago, USA for windows.

Results:

Table 1 depicts 58.4% participants belonged to 15-45 yrs of age group, 71% were females, 64.5% were illiterate, 57.1% were home maker by occupation, 73.8% were married and majority (89.6%) were non-smokers. Socioeconomic status was assessed using the modified BG Prasad's classification. For analysis the Class I & II were grouped together as Upper Socio-economic Class, Class III was considered as Middle Socio-economic Class and Classes IV & V were grouped together as Lower Socio-economic Class. It was observed that majority of the study subjects belonged to the Lower Socio-economic Class (46.3%) followed by Upper Socio-economic Class (27.7%) and Middle Socio-economic Class (26.0%).

Table 2 shows that 310 (28.8%) of participants had High Blood Pressure out of whom 256 (82.6%) were Known Hypertensive and 54 (17.4%) had Raised Blood Pressure for the first time.

Table 1: Socio-demographic Characteristics of Study Population

Socio-demographic Characteristics	Frequency (n)	Percent (%)
Age (Years)		
15-30	294	27.3
30-45	334	31.1
45-60	296	27.5
>60	152	14.1
Gender		
Male	312	29.0
Female	764	71.0
Education status		
Literate	382	35.5
Illiterate	694	64.5
Occupation		
Home Maker	614	57.1
Retired from Govt. Service	76	7.1
Labourer	76	7.1
Govt. Employee	50	4.6
Skilled Worker	156	14.5
Student	104	9.7
Marital status		
Married	794	73.8
Unmarried	282	26.2
Socioeconomic Status		
Upper Class	82	7.6
Upper Middle Class	216	20.1
Middle Class	280	26.0
Lower Middle Class	394	36.6
Lower Class	104	9.7
History of Smoking		
Yes	112	10.4
No	964	89.6
Total	**1076**	**100.0**

Table 2: Prevalence of High Blood Pressure in Study Population

Blood Pressure		Frequency (n)	Percent (%)
1. Normal Blood Pressure		766	71.2
2. High Blood Pressure		310	28.8
	a) Known hypertensive	256	82.6
	b) Raised BP for first time	54	17.4
	Total	**1076**	**100.0**

Table 3: Prevalence of High Blood Pressure in Study Participants by Socio-demographic Characteristics (N=1076)

| Socio-demographic Characters	Blood pressure		p-value	OR
	Normal BP n (%)	High BP n (%)		
Age				
<45 years	434 (73.6)	156 (26.4)	0.058	1.290(0.990-1.681)
>45 years	332 (68.3)	154 (31.7)		
Gender				
Male	218 (69.9)	94 (30.1)	0.541	0.914(0.685-1.219)
Female	548(71.7)	216 (28.3)		
Marital status				
Married	512 (64.5)	282 (35.5)	0.000	0.200(0.132-0.303)
Unmarried	254 (90.1)	28 (9.9)		
History of Smoking				
Yes	78 (69.6)	34 (30.4)	0.702	0.920(0.600-1.409)
No	688 (71.4)	276 (28.6)		
Co-morbidity				
Present	66 (55.9)	52 (44.1)	0.000	0.467(0.316-0.691)
Absent	700 (73.1)	258 (26.9)		
Family history of HTN				
Yes	250 (70.6)	104 (29.4)	0.773	0.959(0.725-1.269)
No	516 (71.5)	206 (28.5)		
Education				
Literate	306 (80.1)	76 (19.9)	0.000	2.048(1.522-2.754)
Illiterate	460 (66.3)	234 (33.7)		
Socioeconomic status				
Upper Class	196 (65.8)	102 (34.2)	0.028	0.707(0.518-0.965)
Middle Class	206 (73.6)	74 (26.4)	0.884	1.024(0.735-1.427)
Lower Class	364 (73.1)	134 (26.9)		
Total	**766 (71.2)**	**310 (28.8)**		

Table 3 depicts prevalence of high blood pressure was found more in age group >45years (37.1%) with participants >45years having greater odds of high blood pressure as compared to <45years however the difference was not statistically significant (P=0.058, OR=1.290(0.990-1.681). Prevalence of high blood pressure was higher in married individuals (35.5%) as compared to unmarried and the difference was statistically significant (P=0.000, OR=0.200(0.132-0.303). Participants with co-morbid conditions had a higher prevalence of blood pressure (44.1%) as compared to those who were without co-morbid conditions and the difference was statistically significant (P=0.000, OR=0.467(0.316-0.691). Illiterates had greater odds of high blood pressure (33.7%) as compared to literates and the difference was statistically significant (P=0.001, OR=2.048(1.522-2.754).

Figure: 1 Distribution of Hypertensives by Compliance To Treatment (N=256)

Figure 1 depicts only 88 (34.4%) participants were compliant to treatment and majority 168 (65.6%) showed non-compliance.

Figure 2: Distribution of participants by reason of non compliance to treatment (N=168)
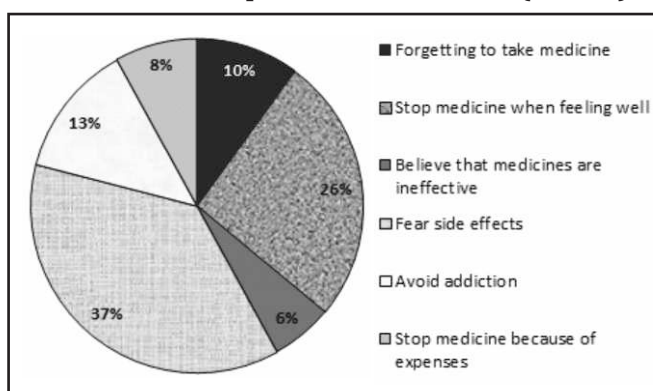
As shown in figure 2, 37% reported not using medication due to fear of side effects, 26% stopped using medication when feeling well (when there is no symptoms). 13% stopped medication to avoid drug addiction while as 10% forgot to take medicine, 8% stopped medication as they could not afford to buy the medicines and 6% considered medication ineffective.

Compliance to treatment was more in hypertensives having family history of hypertension and the difference was statistically significant P=0.005, OR=2.141(1.242-3.691). (Table 4)

Discussion:

In our study 58.3% participants belonged to 15-45 yrs of age group, 71% were females since during data collection most of the males were out for work, 64.5% were illiterate, 57.1% were home maker by occupation, 73.8% were married and majority (89.6%) were non-smokers as being females. In our study overall prevalence of high blood pressure was 28.8%, out of whom majority (82.6%) was known hypertensives and only 17.4% had raised blood pressure for the first time. This was in accordance with the study conducted by Zarka et al where it was found that prevalence of hypertension was 34.12%.[10] Contrary to our study the overall prevalence of hypertension was 17.1% in a study conducted by Ajeet S B et al.[11] The present study also showed that the prevalence of high blood pressure was significantly higher in participants of more than 45 years. This was in accordance with the study conducted in Varanasi by Sing S et al who also found increased prevalence of high blood pressure between 45-54years age group.[12] A higher prevalence of high blood pressure was observed in illiterates in our study (33.7%). Wang et al and Jugal Kishore et al also found that both systolic and diastolic blood pressure were inversely associated with the level of education, independent of all other risk factors. Education makes the people aware of the disease and its prevention.[13,14] Stefanos Tyrovolas et al in their multinational study on risk factors of hypertension reported that compared to normotensive, hypertensive participants were less educated.[15]

Table 4: Treatment Compliance of Known Hypertensive by Socio-demographic Characteristics (N=256)

Socio-demographic Characters	Compliance to treatment		p-value	OR
	Yes N (%)	No N (%)		
Age				
<45 years	48 (34.8)	90 (65.2)	0.881	1.040(0.619-1.745)
>45 years	40 (33.9)	78 (66.1)		
Gender				
Male	22 (31.4)	48 (68.6)	0.542	0.833(0.463-1.499)
Female	66 (35.5)	120 (64.5)		
Marital status				
Married	86 (34.7)	162 (65.3)	0.570	1.592(0.314-8.060)
Unmarried	2 (25.0)	6 (75.0)		
History of Smoking				
Yes	8 (28.6)	20 (71.4)	0.661	0.823(0.345-1.964)
No	80 (35.1)	148 (64.9)		
Co-morbidity				
Present	20 (41.7)	28 (58.3)	0.238	1.470(0.773-2.796)
Absent	68 (32.7)	140 (67.3)		
Family history of HTN				
Yes	38 (46.3)	44 (53.7)	0.005	2.141(1.242-3.691)
No	50 (28.7)	124 (71.3)		
Education				
Literate	12 (35.3)	22 (64.7)	0.903	1.047(0.492-2.231)
Illiterate	76 (34.2)	146 (65.8)		
Socioeconomic status				
Upper Class	20 (30.3)	46 (69.7)	0.946	0.978(0.513-1.862)
Middle Class	28 (46.7)	32 (53.3)		1.96(1.049-3.693)
Lower Class	40 (30.8)	90 (69.2)	2.20	
Total	88 (34.4)	168 (65.6)		

Common risk factors for hypertension, such as co-morbid condition like diabetes, family history of hypertension and smoking have been found to be strongly associated with high blood pressure in the current study. Similar observations were made in P R Deshmukh et al study.[16] As per the studies of Wang et al and Jugal Kishore et al family history of hypertension was seen to be a predictor of hypertension.[13,14] In our study prevalence of high blood pressure was seen more in smokers than in non-smokers however the difference was not statistically significant. Similarly studies by Shanthirani C S et al and Goldstein I B et al also found that tobacco use was associated with hypertension.[17,18] However, it was contrary to the study conducted by Jugal Kishore et al.[14]

Compliance to any medication is always crucial in control of diseases more specifically for chronic diseases and identifying the factors which determine the compliance can have significant impact on treatment outcomes. Although majority (82.6%) of hypertensives in our study were aware of their disease which is a positive finding however only 34.4% of them were compliant to treatment. This gap in knowledge and practice needs to be addressed by way of understanding the reasons for non-compliance as reported by the study participants. The predominant reasons cited for non-compliance were fear of side effects (37%) and a subjective sense of feeling well and hence not feeling need of taking medicines as perceived by respondents (26%). Besides this 13% of respondents stop taking medicines for fear of getting addicted to it. This was in accordance with the study conducted by Angelina Alphonce Joho.[19] However, it was contrary to the study conducted by Hashim et al in Pakistan.[20] Studies done in Tamil Nadu by Venkatachalam J et al and Andhra Pradesh by Hema K. and Padmalatha P reported a compliance of 24.1% and 15.3% respectively.[21,22] Similar studies done in Ethiopia by Ambaw et al and Malaysia by Khalil A et al observed a high rate of compliance to therapy at 64.6% and 48.7% respectively.[23,24] Our study showed that certain socio-demographic characteristics like age,

gender, marital-status and co-morbidity had no significant association with the compliance. Similar findings were observed in a community-based study by Venkatachalam J et al in Tamil Nadu.[21] Present study revealed that certain demographic characteristics like smoking, family history of hypertension, literacy and SES had significant association with compliance to therapy (P<0.05). This was in accordance with the study conducted by Hema K. and Padmalatha P in Andhra Pradesh where demographic characteristics like age, sex, type of family, literacy status had significant association with compliance to therapy (P<0.05).[22] Similar study done by Aarti M Nagarkar et al (2013) in a tertiary care hospital in Pune, found that medication compliance was significantly associated with age, family type and experience of symptoms.[25]

Conclusion :

The prevalence of high blood pressure was high and compliance to medication was low in the study population. Some of the demographic characteristics had significant influence on compliance.

Limitation : Many predictors of hypertension like daily salt intake, lipid profile, stress were not assessed.

Recommendations : Imparting health education and counseling at the time of visit to health institutions by the patient and during home visits by health workers can improve the compliance level which is vital for control of hypertension. Strategies included may involve patient education, enhanced communication with the patient focused towards behavioral change. Awareness generation regarding the perceived susceptibility and severity of the disease, besides the benefits of the life style modification and timely treatment will help a long way in adopting a healthy life style and compliance to treatment.

Declaration:

References:

1. Quigley MA. Shifting burden of disease–epidemiological transition in India. Int J Epidemiology 2006; 35:1530-1.

2. https://timesofindia.indiatimes.com .WHO report. Non-communicable disease as a cause of death. Sep 2017.

3. World Health Organization (WHO). A global brief on Hypertension-World Health Day 2013. Available from the following PDF link http://apps.who.int/iris/bitstream/10665/79059/1/WHO_DCO_WHD_2013.2_eng.pdf?ua=1

4. Ong KL, Cheung BMY, Man YB, Lau CP, Lam KSL: Prevalence, Awareness, Treatment, and Control of Hypertension among United States Adults 1999–2004. Hypertension 2006, 49:69-75.

5. Balkrishnan R: The importance of medication adherence in improving chronic-disease related outcomes: what we know and what we need to further know. Med Care 2005, 43(6):517-520.

6. Haynes RB, Sackett DL, Gibson ES, Taylor DW, Hackett BC, Roberts RS, Johnson AL. Improvement of medication compliance in uncontrolled hypertension. Lancet. 1976; 1(7972):1265–8.

7. Kim MJ, Choi MH. Knowledge, Compliance and Quality of Life of Mothers of Children with Atopic Dermatitis. Journal of Korean Academy of Child Health Nursing. 2011; 17(4):272–80.

8. Chow CK, Teo KK, Rangarajan S, et al. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. JAMA 2013; 310:959–968.

9. Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, Chen J, He J. Global disparities of hypertension prevalence and control: a systematic analysis of population-based studies from 90 countries. Circulation 2016; 134: 441–450.

10. Masoodi Z A, Mir R A. Prevalence and Determinants of Hypertension in Kashmir: A Cross Sectional Study. IOSR Journal of Dental and Medical Sciences. 2016; 15(6): 57-64.

11. Ajeet S. Bhadoria, Pradeep K. Kasar and Vikrant Kabirpanthi. Prevalence of hypertension and associated cardiovascular risk factors in Central India.2014 Jan-Apr; 21(1):29-38.

12. Singh S, Shankar R and Singh G P. Prevalence and Associated Risk Factors of Hypertension: A cross-Sectional Study in Urban Vaaranasi. Available at https://doi.org/10.1155/2017/5491838.

13. Y Wang, J ChenJ, K Wang, CL Edwards . Education as an important risk factor for the prevalence of hypertension and elevated blood pressure in Chinese men and women. Journal of Human Hypertension. Vol. 20 no. 11, pp. 898-900, 2006.

14. J Kishore, N Gupta , C Kohli ,N Kumar . Prevalence of Hypertension and Determination of Its Risk Factors in Rural Delhi. International Journal of Hypertension. Volume 2016 (2016) Article ID 7962595.

15. Stefanos Tyrovolas, Josep Maria Haro, Evangelos Polychronopoulos et al. Factors Associated With Components of Arterial Pressure Among Older Individuals (the Multinational MEDIS Study): The Role of the Mediterrean Diet and Alcohol Consumption. The Journal of Clinical Hypertension. Vol. 16 No. 9,2014:645-6

16. PR Deshmukh, S S Gupta, AR Dongra ,MS Bharambe , et al. Relationship of anthropometnc indicators with blood pressure levels in rural Wardha. Indian J Med Res 2006; 123:657- 64.

17. CS Shanthirani , R Pradeepa ,R Deepa , G Premlatha , R Saroja ,V Mohan . Prevalence and risk factors of hypertension in a selected South Indian population-the Chennai Urban Population Study, J Assoc Physians India 2003; 51:20-7

18. IB Goldstein, D Shapiro, D Guthrie . Ambulatory blood pressure and family history of hypertension in healthy men and women. Am J Hypertens 2006; 19:486- 491.

19. Angelina Alphonce Joho .Factors Affecting Treatment Compliance among Hypertension Patients in Three District Hospitals - Dar Es Salaam. Muhimbili University of Health and Allied Sciences (MUHAS) October, 2012

20. Hashmi, S. K., Afridi, M., Abbas, K., Sajwani, R. A., Saleheen, D., philippe, M., et al. (2007). Factors Associated with Adherence to Anti-Hypertensive Treatment in Pakistan. PLoS ONE, 2 (3), e280.

21. Venkatachalam J, Abrahm SB, Singh Z, Stalin P, Sathya GR. Determinants of patient's adherence to hypertension medications in a rural population of Kancheepuram District in Tamil Nadu, South India. Indian J Community Med 2015; 40:33-7.

22. Hema K. and Padmalatha P. Adherence to medication among Hypertensive patients attending a tertiary care hospital in Guntur, Andhra Pradesh. Indian Journal of Basic and Applied Medical Research; December 2014;4(1):451- 456.

23. Ambaw et al. Adherence to antihypertensive treatment and associated factors among patients on follow up at University of Gondar Hospital, Northwest Ethiopia. BMC Public Health 2012 12:282.

24. Khalil A, Syed Azhar SS, Abbas N, Al Barq. Establishing the validity of morisky scale as a measure of medication adherence to antihypertensive therapy in Malaysia. Malay J Pharm Sci 2010;8:1-9.

25. Nagarkar AM, Gadhave SA, Sharma I, Choure A, Morisky D. Factors Influencing Medication Adherence among Hypertensive Patients in a Tertiary Care Hospital, Pune, Maharashtra. Natl J Community Med 2013; 4(4): 559-63.