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## RESEARCH ARTICLE

# HYPERTENSION IN ELDERLY: PREVALENCE AND HEALTH CARE SEEKING PATTERN IN AN URBAN SLUM OF BANGALORE CITY

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### ABSTRACT

**Objectives:** To find the magnitude of hypertension and its risk factors among individuals above the age of 60 years. To assess co-morbidities and drug compliance among individuals with hypertension.

**Method:** A cross sectional study was conducted among elderly individuals >60 years residing in urban slum. Study subjects were screened for hypertension by house to house visit. The individuals were classified according to WHO guidelines for hypertension. Details of risk factors, comorbidities, health care utilisation, and anthropometry were collected from those found to have hypertension. Moriskys 8 item scale was administered to them to assess compliance to hypertension medication.

**Results:** Prevalence of hypertension was 31.5%. Positive family history of hypertension was given by 32.3% of individuals. 35.4% were overweight and 36.5% were obese, 68.8% had sedentary life style. Type II Diabetes Mellitus was the most common comorbidity- 67.64%. It was found that 61.4% had good drug compliance. Pearson's Chi square test showed significant association ( $p < 0.005$ ) between compliance to medication and number of drugs consumed. Majority of the subjects 42.3% visited private clinics and nursing homes for follow up.

**Conclusion:** The prevalence of hypertension is high among elderly slum dwellers of Bangalore. Lack of physical activity and obesity were important risk factors. Due to better availability of health care facilities, follow up and compliance to medication was good. This was reflected by less number of hypertension related complications in study population.

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## INTRODUCTION

We live in an ageing world, in which better public health has resulted in longevity. By 2030, those over 60 will outnumber those under 15, with the fastest growth in the developing world[1]. Between 2010 and 2050, the share in 65 and older is expected to increase from 5% to 14%, while the share in the oldest old age group (80 and older) will triple from 1% to 3%[2]. Life expectancy at birth in India rose from 37 years in 1950 to 65 years in 2011, reflecting declines in infant mortality and survival at older ages in response to public health improvement.

Among various non communicable diseases raised blood pressure or hypertension is one of the commonest non-communicable diseases worldwide. According to WHO data on non-communicable disease May 2012, one in three adult has raised blood pressure [3]. Hypertension is a major risk factor for cardiovascular, cerebrovascular diseases, chronic renal failures etc. and accounts for 53% of deaths and 44% of Disability Adjusted life Years (DALYS) worldwide[3]. Study on epidemiological trends of hypertension in India by Gupta R *et al* gives a prevalence of 25% in urban and 10% among rural

inhabitants in general[4]. However, with respect to age prevalence of hypertension is as high as 64% after 6<sup>th</sup> decade[4]. Most of the studies have shown an increase in proportion of hypertension prevalence with increasing age.

The common modifiable risk factors for hypertension are sedentary life styles, increased consumption of fat and salt in diet, smoking, alcoholism, stress etc. These factors are inter-related to each other such that, appearance of these factors paves the way for non-communicable diseases like hypertension, diabetes mellitus, cardiovascular diseases etc.

Earlier there was a difference in life style patterns in urban and rural population, but off late due to rapid industrialisation and urbanisation the life style pattern of urban and rural population is almost similar. Hypertension which was earlier known to be a disease of cities, white collar jobs and the rich has become common even among villagers, blue collar and low income groups.

Individuals with low income in cities usually dwell in slums, where people's work nature varies between moderate to severe labour. Thus most of them may not be exposed to sedentary life

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style which is one of the risk factors for hypertension. But, on the other hand because of their lack of education they are exposed to behavioural risk factors like alcoholism, tobacco abuse, and excess of fat and salt intake.

Among slum dwellers, the people in the geriatric age face problems because of their physical and financial dependency. Some of them have financial constraints to purchase the drugs/visit a clinic for follow up, lack of care givers to take them to health facility and visual/hearing impairments which make it difficult to follow physician's instructions.

One of the reasons for inappropriate health seeking behaviour is lack of awareness regarding hypertension. This in turn has resulted in increasing morbidity and mortality among elderly. This is more so among slum dwellers where most people are illiterate and are unaware of health care facilities available. Hypertension being a chronic disease requires life time medication for better control. Availability of medications, adhering to treatment regimen is of utmost importance to prevent untoward complications like myocardial infarction, stroke, and renal failure etc.

There is a need to look into health seeking pattern of the urban elderly population of India especially with regard to non-communicable disease like hypertension in order to provide appropriate services to them. With this in mind, a cross sectional study was undertaken to provide screening for hypertension to all the elderly and assess their compliance to medication in Parvatipura, an urban slum in Bangalore city.

## Objectives

1. To find the magnitude of hypertension among individuals above the age of 60 years.
2. To determine the risk factors among individuals with hypertension.
3. To assess co-morbidities among study subjects.
4. To assess drug compliance among individuals with hypertension.

## METHODOLOGY

A cross sectional study was conducted among elderly individuals (60 years and above) residing in Parvatipura, urban field practice area of KIMS for a period of 6 months. A baseline survey was done by house to house visit. During this, all the individuals above the age of 60 years were screened for hypertension. Calibrated mercury Sphygmomanometer was used to record blood pressure and the recording of the individuals were classified according to World Health Organization guidelines for hypertension[5].

For individuals known with hypertension and on treatment, only one reading was recorded. For those detected to have blood pressure reading of more than 140/90mm Hg for the first time, a second measurement was taken. If second reading was substantially different from the first, a third reading was taken. The average of last two readings was considered to be

diagnostic of hypertension[5]. Critically ill and non-cooperative elderly were excluded from screening.

The socio demographic information and risk factors for hypertension like age, sex, family history, smoking, physical activity etc. was collected by interviewing the subjects using a pre-tested and structured proforma.

Anthropometric measurements of individuals with hypertension like height in centimetre using stadiometer to nearest 1cm and weight in kilograms to nearest 0.1 kg were taken using Omran digital weighing scale. General physical examination and systemic examination were conducted on study subjects to find out any undiagnosed comorbidities/complications.

Information regarding self-disclosing co-morbidities was collected from individuals with hypertension. This was done by eliciting history and with the help of investigations available with them at the time of survey.

Compliance to drugs was assessed in all those found to have hypertension using Moriskys 8 item scale[6]. This scale scores the patients' medication adherence using 8 questions related to their medication consumption. A score <2 means good adherence and  $\geq 2$  means poor adherence. For newly diagnosed individuals with hypertension drug compliance was assessed after 3 months of pharmacotherapy initiation.

The data was analysed using SPSS version 20 for computation and inferential statistics.

## RESULTS

A total of 304 elderly individuals were screened for hypertension of which 141 were males and 162 females.

Known cases of hypertension were 92 and newly detected cases were 4 in number. Out of 304 elderly 96 were found to have hypertension. The prevalence of hypertension among elderly was 31.5%. Of the 96 subjects 32 (33.3%) were males and 66 (66.7%) were females. Mean age of study population was 67.01 years. Among these 72 (75%) were young old [60-70 years], 22 (22.9%) were old old [71-80 years] remaining 2 were oldest old [ $>80$  years]. Majority of the study subjects were Hindus by religion, constituting 67 (69.8%), 28 (29.2%) were Muslims and 1% was Christians by religion. Proportion of illiteracy was 43 (44.8%) followed by 25 (26%) with less than 12 years of schooling and 28 (29.2%) with more than 12 years of schooling. Modified B.G Prasad's classification for the year 2013 was used to assess socio economic status of the study subjects. It was observed that 47 (47%) of them belonged to class I, 33 (33.4%) to class II and remaining 16 (16.7%) to class III socio economic group. Regarding occupation, a total of 21.8% gainfully employed in jobs, 18 (18.8%) were retired from jobs and the rest 57 (59.4%) were home makers (all of them women). Majority of individuals were either presently married - 45 (46.9%) or widowed - 47 (49%) and only 4 (4.1%) were unmarried/separated/divorced (Table 1).

**Table 1** Demographic Profile Of Elderly Individuals N=96

<b>Sex of hypertensive</b>	<b>32 (33.3)</b>
<b>Male</b>	<b>64 (66.7)</b>
<b>Female</b>	
Age category in years	72 (75)
60-70	22 (22.9)
71-80	1 (1)
81-90	1 (1)
>90	
Religion	67(69.8)
Hindu	28(29.2)
Muslim	1 (1)
Christian	
Education status	43 (44.8)
Illiterate	25 (26)
Schooling <12 years	28 (29.2)
Schooling >12 years	
Socio economic status	47 (48.9)
Class I	33 (34.4)
Class II	16 (16.7)
Class III	
Marital status	45 (46.9)
Married	4 (4.1)
Unmarried/divorce/separated	47 (49)
Widower	
Occupation	21 (21.9)
Employed	57 (59.4)
House wife	18 (18.8)
Retired	

Various modifiable and non-modifiable risk factors were studied among these elderly study subjects. It was observed that mean duration of hypertension was 2.26 years. Mean systolic blood pressure was 141.26 mm hg and mean diastolic blood pressure as 86.73 mm hg. Positive family history of hypertension was given by 32.3% of individuals. According to Asia Pacific guidelines for BMI, 28.1% were in normal range [18.5-24.5], 35.4% were overweight [25-30] and remaining 36.5% were obese [>30]. Information was collected regarding regular physical activity like yoga, walking, jogging, exercise etc. It was found that 68.8% of elderly had a sedentary life style and only 31.3% were involved in some sort of regular physical activity. Among 96 elderly with hypertension 8.95% reported one or more of substance use like alcohol/smokeless or with smoke tobacco consumption (Table 2).

**Table 2** distribution of study subjects based on risk factors n=96

Risk factors	Percentages
Family history	32.3
Yes	67.7
No	
Physical activity	31.2
Yes	68.8
No	
BMI	28.1
Normal	35.4
Over weight	36.5
Obese	
Personal habits	10.5
Yes	89.5
No	

Information regarding self-disclosing comorbidities revealed that 60 out of 96 individuals (62.5%) had one or multiple comorbidities. Most common comorbidity was Type II Diabetes Mellitus and it accounted for 67.64% of the total comorbidities, asthma was found in 11.78% individuals and the

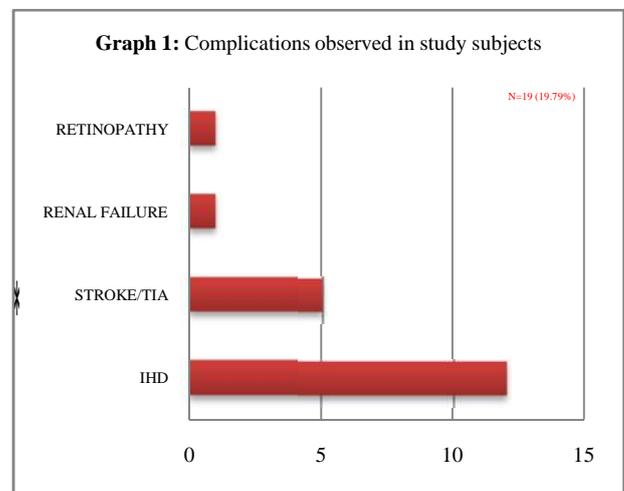
rest reported arthritis- 8.82%, hypothyroidism- 8.6%, glaucoma and epilepsy 1.47% each (Table 3).

**Table 3** Distribution of Study Subjects Based On Self-Reported Comorbidities

Type of comorbidity	Percentages
Diabetes mellitus	67.64
Arthritis	8.82
Asthma	11.78
Glaucoma	1.47
Hypothyroidism	8.6
Epilepsy	1.47
Total	100

Diabetes mellitus was the most common co morbidity among study subjects

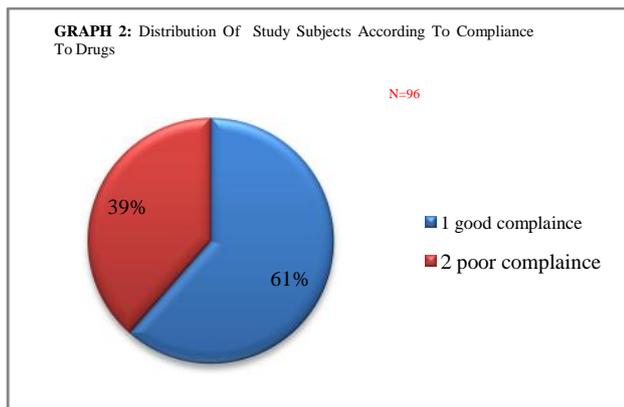
Complications secondary to hypertension was found in 19 out of 96 (19.7%) of study subjects. Of this, the major contributor was IHD, followed by Cerebrovascular Accidents like stroke/TIA, hypertensive nephropathy and retinopathy (Graph1).



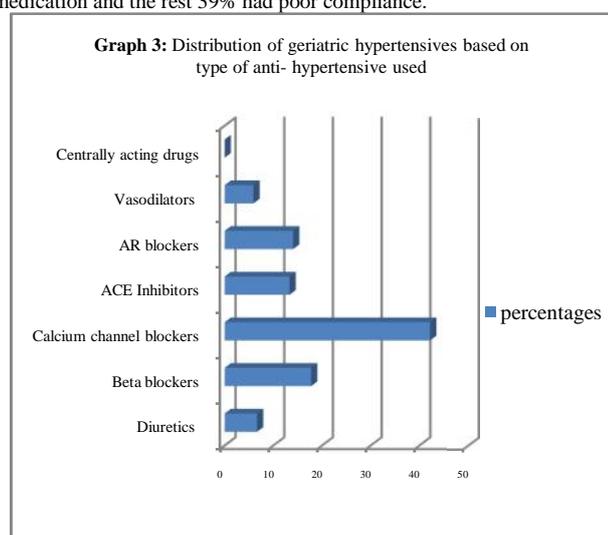
It was observed that 19 (19.79%) out of 96 individuals had one or more complications secondary to uncontrolled hypertension. Majority had Ischaemic Heart Disease, followed by stroke/Transient Ischaemic attack, renal failure and hypertensive retinopathy in decreasing order.

Compliance to hypertension medication was assessed among all the 96 elderly using Morisky's 8 item scale. It was found that 59 (61.4%) had good compliance with a score of <math>\leq 2</math> and rest 37 (38.6%) had poor compliance to medication with a score >2 (Graph 2). Reasons for poor compliance were found were forgetfulness 12 (32.43%), occasions like fasting and feasting 22 (59.45%).

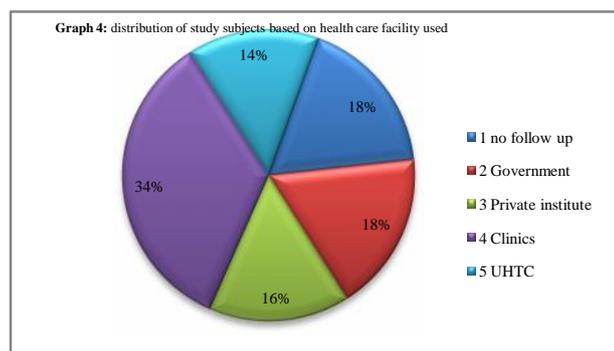
The study subjects were on one or more class of anti-hypertension drugs 30 (31.25%) for better blood pressure control. It was found that majority of the subjects were on calcium channel blockers 54 (56.25%) followed by beta blockers 24 (25%), Angiotensin receptor blockers 19 (19.79%), ACE inhibitors (18.75%), diuretics 9 (9.37%) vasodilators 8 (8.33%) in decreasing order of use. Least prescribed was centrally acting anti-hypertensive (Graph 3). Pearson's Chi square was used to find the association between total number of medication intake by an individual and compliance to medication and the test was statistically significant ( $p < 0.005$ ). With increase in number of drugs to be consumed, the compliance to medication decreased (Table 5).



The compliance score using Moriskys' 8 item scale to hypertension medication was collected from all the study subjects. It was found that 61% of the study subjects had good compliance to hypertension medication and the rest 39% had poor compliance.



It was found that majority of the subjects were on calcium channel blockers followed by beta blockers, Angiotensin receptor blockers, ACE inhibitors, diuretics, vasodilators in decreasing order of use. Least prescribed was centrally acting anti-hypertensives.



It was observed that 18% of the study subjects (n=96) did not visit any health facility for follow up. Of the rest 82% who used different health setup, 18% availed government health facilities, 16% visited private institutes like medical colleges, 14% visited our Urban Health Training Centre (UHTC) and the majority 34% visited private clinics and nursing homes for follow up.

Health seeking pattern of the elderly hypertensive individuals was assessed in terms of follow up, frequency and health setting of follow up, availability of records for follow up. Based on all these the regularity of follow up of the study subjects was assessed. It was seen that 81.25% were on regular

follow up and 18.75% had no follow up (Table 4). Proportion of study subjects who visited government health setting for follow up was 21.79%, private institutions- 19.23%, private clinics and nursing homes- 42.30% and rest 17.94% visited our Urban Health Centre (Graph 4). Most of individuals 43.58% visited health facility only when ill, 38.46% had a monthly follow up, 12.82% were on follow up once in 3 months and 5.12% had once in 6 months. Among those on regular follow up 39.58% had records (Table 4).

**Table 4** Distribution Of Study Subjects Based On Health Seeking Pattern

Parameter	Percentage
Follow up	
Yes	81.25
No	18.75
Frequency of follow up	
Only when ill	43.58
Monthly	38.46
Once in 3 months	12.82
Once in 6 months	5.12
Health care facility	
Government	21.79
Private institute	19.23
Clinics	42.30
UHTC	17.94
Availability of records of follow up	
Yes	39.58
No	60.41

**Table 5** pearsons chi square test to show association between no. Of drug intake and drug compliance

Compliance	Total no.of drugs taken		Chi square value	p value*
	<=2	>2		
Good	36	23	0.865	0.039
Poor	30	7		
Total	66	30		

\*p value<0.005 is significant.

This table shows that there was significant association between total no of drug intake and compliance to medication.

## DISCUSSION

The geriatric population with hypertension in the present study was 31.5%.This prevalence of hypertension among urban elderly is low when compared to studies conducted by SD Kandpal *et al*-43.3% [7]and Lena *et al* - 59.1% [8]. In general the prevalence of hypertension in geriatric population varies between 30%-60%. This wide variation observed may be due to difference in the methodologies and study settings involved. It may also be because of difference in prevailing risk factors which differ from place to place.

In our study, prevalence of hypertension among females (66.7%) was more than in males (33.3%). No such difference in hypertension among sexes was observed in study conducted by K Shraddha *et al* [9], whereas a study done by RP Thakur *et al* showed an increase in proportion of hypertension among females than males [10]. Hypertension prevalence is less in women than in men until 45 years of age, is similar in both sexes from 45 to 64 and is much higher in women than men over 65 years of age[11].

Most of the study subjects were young old belonging to age group of 60-70 years (72%) which is similar to study conducted

by SD Kandpal *et al* [7] and another study by Khokkar A *et al*. Illiterate individuals constituted 44.8% of the study population. Study RP Thakur shows similar result of 42.8% illiterates [10].

In the present study 15.3% of men and 6.5% of women was gainfully employed. The remaining 71.9% of the elderly were either retired or home makers in case of females. In study by A Khokkar *et al*, 21.9% men and 12.5% women among elderly were gainfully employed [12].

Modified BG Prasad classification showed that 48.9% individuals belong to class I of socio economic status. A similar study by M Mehra *et al* shows majority of individuals belonging to middle income groups [12].

Mean age of individuals was 67.1 years. Similarly, study conducted by RP Thakur *et al* gives mean age of urban elderly as 67.9 years [10].

In our study 32.3% of elderly had a positive family history of hypertension. This result is higher than that of multi centric hospital based study by Ajay K Singh *et al*, where family history of hypertension was 21.2% [13].

In our study 35.4% and 36.5% of individuals were overweight and obese respectively. A study by A Khokkar *et al* showed similar results with 30.76% men and 42.5% men having obesity [12]. SD Kandpal *et al* showed similar results of overweight (31.1%), whereas proportion of obese was less (13.9%) [7]. This difference may be due to difference in dietary habits of people and the guidelines adapted to classify obesity. In our study 31.2% of elderly were engaged in some form of regular physical activity like walk/jog/exercise/yoga etc. This is much higher when compared with the study by A Khokkar, wherein only 10.52% were physically active [12].

Individuals with current habits of alcohol and tobacco consumption constituted only 8.95% of study population. This is far less when compared to results of A Khokkar *et al*, where 30.35% and 15.62% of study population were consuming alcohol and tobacco abuse respectively [12].

Majority of the study population had type II Diabetes Mellitus- 67.64%. Study by Datta Pratyay Pratim *et al* gives Diabetes prevalence to be 26.1% [14].

Ischaemic Heart Disease (12 of 19) 89.47% was found to be the major complication of uncontrolled hypertension followed by stroke, renal failure and retinopathy. Study by Datta Pratyay Pratim *et al* showed significant association between hypertension and cardio and cerebro vascular complications [14]. No such association could be established in our study probably due to small sample size.

In our study 99% were on anti-hypertensive medication. Morisky's 8 item scale showed that 61.5% of our study subject had good compliance to anti-hypertensive drugs. This contrasts to study by DP Pratim *et al* where 38.46% were not on any medication for hypertension control [14]. Though most of our study population was illiterate, better awareness about

hypertension and availability of free drugs at nearby Government hospitals and our UHTC has made this difference. Non availability of free of cost medication is quoted as the major cause for non-compliance in study by R Susan *et al* [15]. But in our study it was mainly fasting, feasting and forgetfulness that resulted in non-compliance.

Statistically significant association was found between number of drug/tablet intake and drug compliance ( $p < 0.05$ ).

In the present study majority of study subjects visited private clinics (34%) for follow up. Results by Ean-fre' de' ric levesque *et al* showed 77% of population utilising private clinic services. This high utilisation of private clinic in the study was attributed to easy accessibility, less waiting time and better attention provided at clinics when compared to government hospitals [16].

## CONCLUSION

The prevalence of hypertension is high among elderly slum dwellers of Bangalore. Lack of physical activity and obesity were important risk factors associated with hypertension. Diabetes mellitus was the most common comorbidity. Due to better availability of health care facilities, follow up and compliance to medication was good. This was reflected by less number of complications reported in study population secondary to uncontrolled hypertension.

## Recommendation

All elderly slum dwellers must be periodically screened for hypertension, to detect new cases as well as to ensure good control among known case of hypertension. It is essential to improve their awareness regarding hypertension, risk factors, complication and need for life time treatment. This in turn will reduce morbidity and mortality among geriatric population.

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