

Original article

Prevalence and clinical profile of hypertension in elderly subjects in tertiary care centre

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ABSTRACT

Background - The increase in longevity due to improvement in socio-economic conditions and health care facilities has led to surge in elderly population (>60 years) as well in related illnesses such as cardiovascular (CVS) diseases worldwide including India. This study is to determine prevalence, symptoms, clinical signs including anthropometric examination and laboratory work-up of elderly hypertensive patients.

Methodology – After institutional ethics committee approval and written informed consent from participants, an observational prospective study was conducted in hypertension clinic of tertiary care hospital over a period of one year on 252 elderly hypertensive patients (age more than 60 years).

Results – The prevalence of elderly hypertensive patients attending hypertension clinic of a tertiary care hospital was 11.03 %. Females (56.3%) outnumbered males (43.7%) with maximum patients (56.7%) in the age group of 60 to 65 years. Out of 252 elderly Hypertensive subjects 25 (9.9%) were newly diagnosed to have hypertension, 56% out of them had isolated systolic hypertension. Giddiness was the most common symptom (55.8%) followed by headache (35.6%) and 16.3% of patients were asymptomatic. 24.1% of elderly hypertensive were diabetic, 48.4% subjects had BMI >25 , 20.2% had abnormal waist circumference and 89.7% had abnormal waist to height ratio. 31.3% study subjects had dyslipidemia. Mean waist circumference was more in males (p value: 0.001) and waist to height ratio was more in females (p value:0.001). Total cholesterol was significantly higher in females as compared with males (p value:0.008). Cardiac involvement was observed in 5.5% , cerebrovascular in 4 % , retinopathy in 14.3% and renal in 10.4% elderly subjects. Single organ involvement was seen in 39.3% and multiple organs were involved in 40.1 %.

Conclusions – With rise in the population of elderly people , it is imperative to manage hypertension effectively and to regularly screen these patients for associated co-morbidities and the end organ damages.

Keywords – Elderly hypertension ,co morbidity, end organ damage

Introduction:

One of the most striking changes in the demography of the world has been the increased proportion of elderly individuals in the population, who are considered as the “Geriatric” individuals of age 60 years and above. In India awareness of hypertension, its risk factors and complications is very poor. We see many patients with hypertension diagnosed for the first time in 5th and 6th decade. The increase in longevity due to improvement in socio-economic conditions and health care facilities has led to surge in elderly population (>60 years) as well in related illnesses such as cardiovascular (CVS) diseases worldwide including India. Many of these elderly patients are asymptomatic, due to which they remain undiagnosed for a very long time. And finally they present with end-organ complications, which are irreversible.

Numerous studies from developed countries conducted on general population including elderly subjects have reported that there is continuum of risk for CVS ailments with increasing Blood Pressure (BP).^[1,2] Hypertension has been reported in 40 to 48% geriatric patients in India^[3,4] and is the commonest risk factor present for CV diseases (CVD) in this population.^[5,10] It is estimated that by the year 2025 the majority of the elderly people worldwide will reside in developing countries.^[6] Thus, the elderly population will assume greater importance by their sheer numbers as far as both preventive and curative health care services are concerned.

In emergency department patients with hypertension presenting directly with cerebrovascular or cardiovascular complications due to advanced stages. Therefore with increased life expectancy, prevention and treatment of hypertension and target organ

damage in elderly remain important health challenge. Alcoholism, smoking, obesity, Diabetes mellitus, dyslipidemia are independent risk factors for elderly hypertension. Isolated systolic hypertension (ISH) is the commonest cause of raised blood pressure in the older population.^[7] The majority of hypertensive patients in this age group have ISH and its prevalence increases with age.^[8,9] Early detection and treatment can significantly reduce CVS and CVD related mortality along with improvement in quality of life. The present study was planned to describe the clinical profile and associated factors in elderly hypertensive subject thus giving insight into magnitude of problems in elderly hypertensive in tertiary care center and strategy to mitigate its complications can be formulated.

Methodology:

This was an observational and prospective study. After obtaining institutional ethics committee permission and obtaining written and informed consent from patients who fulfilled inclusion and exclusion criteria, patients recruited over period of 1 year from 1st July 2012 to 30th June 2013. The study included all the hypertensive subjects of 60 or more than 60 years attending hypertension clinic of our institution, over a period of one year while nonhypertensive elderly subjects were excluded from study. Individual patient was asked regarding detailed history about hypertension, symptoms, personal habits, occupation and other systemic disease. Detailed physical examination and other relevant general and systemic examination including brief physical examination, blood pressure measurement, anthropometric measurement was carried out and entered in the proforma. The routine investigations reports mandatory for all hypertension patients (as per JNC VII recommendation)^[11] and the specific

investigations to investigate the end organ damages in elderly population if available with patient were entered in the proforma. After applying inclusion and exclusion criteria patients were divided in 3 groups as per age 60-65 years , 66 to 70 years and more than 70 years. Student t-test of significance was applied for the statistical difference between the elderly males and females hypertensive subjects. Anova test was applied for the age group (60-65 years, 66-70 years , >70years) and related correlation.

Observations and Results :

Total number of patients attended hypertension clinic during study period of 1st July 2012 to 30th June 2013 were 2284 out of which elderly hypertensive subjects studied were 252. Hence prevalence of elderly hypertensive subjects studied was 11.03%. Females (56.3%) outnumbered males (43.7%) with maximum patients (56.7%) in the age group of 60 to 65 years (Table.1). Out of 252 patients 227(91.1%) were known hypertensive and 25 (9.9%) were newly diagnosed as hypertension. 14 patients out of 25 newly diagnosed cases were male and 11 were female. 13(68.9%) male and 8(38.1%) female out of newly diagnosed cases had stage 1 hypertension while 1 male (25%) and 3(75%) female patients had stage 2 hypertension (As per JNC 7). Isolated systolic hypertension was present in 14(56%) out of 25 newly diagnosed cases of hypertension , while systolic and diastolic hypertension was present in remaining 11(44%) patients . The prevalence of Isolated Systolic Hypertension in the studied newly diagnosed elderly hypertensive was 56%. In 21.6 % (44 out of 227) of known hypertensive subjects target blood pressure (<140/90) was not achieved (As per JNC 7). In 162 (64.2%) patients out of 252 , duration of hypertension was between 2 to 10 years , of which 93

patients were female and 69 patients were male (Figure 1).

Giddiness was the most common presenting symptom in 141(55.8%) , followed by headache in 90 (35.6%) , while 41(16.3%) patients were asymptomatic at the time of presentation (Table 2). 17.5 % (44 out of 252) of patients had more than one symptom. 62(24.6%) were tobacco chewers, 35(13.9%) were smoker and 20(8%) patients were alcoholic. Family history of hypertension was present in 34(13.5%) patients. 61(24.1%) were diabetic, 122 (48.4%) were obese out of which 67 were female. 99 (39.3%) elderly had 1, 67 (26.6%) had 2, 26 (10.3%) had 3 associated co morbidities, while 52(20.6%) individuals there were no associated co morbidities. Body Mass Index (BMI) was high i.e. > 23 in 175 (69.4%) patients out of which 79 were male and 96 were female. Out of these 175 individuals with High BMI ,53 were overweight with BMI of 23 to 24.9 ,while 122 were Obese with BMI >25. Abnormal waist circumference was observed in 51(20.2%) patients out of which 35 (68.6%) were female. Abnormal waist to height ratio was found in 226(89.7%) patients with female preponderance of 128 (56.5%). Dyslipidemia was present in 79(31.3%) out of which 53 were female.

Out of elderly patients on antihypertensive medicines, 231 (91.7%) were compliant with therapy, out of which 113 (44.8%) were on monotherapy. Calcium channel blocker (CCB) was most commonly prescribed drug in 197 (78.2%) followed by Angiotensive receptor blocker 87 (34.5%) and diuretics 58 (23%). Pedal edema and dry cough were common adverse drug effects observed in elderly hypertensive patients.

Discussion:

Cardiovascular disease is most common cause of death in older person and also accounts for major portion of health morbidity. Ageing in absence of disease exerts a clinically significant influence on structures and functions of several component of cardiovascular system. The increase in longevity due to improvement in socio economic condition and health care facilities has lead to surge in elderly population (> 60 years) as well as in related illness such as cardiovascular diseases including India.

We studied clinical profile of elderly patients attending hypertension clinic of tertiary care center in metropolitan city from July 2012 to June 2013, 2284 (571 new cases, 1713 follow up cases) patients visited the hypertension clinic. Out of these patients, 252 patients were of age more than or equal to 60 years. Thus the prevalence of elderly hypertensive subjects attending hypertension clinic was 11.03% . After a literature search, we came across a study from Delhi by Dwivedi et al ^[5] who studied 205 elderly subjects. Study from Mumbai reported by Vrinda Kulkarni et al ^[12] in September 2001 reported 136 elderly hypertensive subjects. Another study from Assam by N C Hazarika et al ^[13] studied the 888 elderly population and they found that in elderly population the overall prevalence of hypertension was 63.63%.

Age in elderly hypertensive subjects

We divided the studied population into 3 groups namely 60-65, 66-70, > 70 years. Mean age of elderly hypertensive subjects was 66.8 (+/-5.9) (Range 60 to 87 years), mean age of males was 67.8 (+/- 6.4) (Range 60 to 87 years) and that of females was 65.9 (+/- 5.3)(Range 60 to 83 years) (Table 1)

In the study by Dwivedi et al ^[5] (2000), mean age was 67.36(+/- 6.23) years (range 60 to 90 years).

The population based study reported by NC Hazarika et al ^[13] (2003) from Assam reported mean age of elderly participants as 66.24 (+/-6.08) years.

Gender wise distribution of elderly hypertensive subjects

In our study, out of 252 subjects 110 (43.7%) hypertensive elderly were males and 142 (56.35) were females. Thus female to male ratio of studied subjects was 1.3 :1(Table 1). In the study reported from Delhi by Dwivedi et al ^[5] , female to male ratio was 0.69 :1. Also in 2001 study by Vrinda Kulkarni et al^[12] documented male preponderance. (Male to Female ratio was 1.3 :1) . Thus increasing prevalence of hypertension in elderly female is observed in contrast to previous studies in India.

Age group and Gender in elderly hypertensive

In our study 143 (56.7%) patients were in age group of 60 to 65 years followed by 51 (20.2%) in 66 to 70 years of group and 39 (15.6%) from age group 70 to 75 years. Only 7% of patients were > 75 years of age(Table 1). In the age group of 60-65 years, majority (N: 89, 62.2%) of subjects were females and only 37.8% were males. In the age group of 71-75 years, males (64%) outnumbered females (34.9%) (Table1).

When we compared these trends with other studies we found that, 58.1% patients, belonging to 60-65 years were reported by Vrinda Kulkarni et al ^[12] of which 30.9% were males . Dwivedi et al ^[5] , also reported maximum number of subjects in 60-65 years age group (48.8%). However in our study males outnumbered females in the age groups of 71-75 years.

Category and Duration of Hypertension in elderly subjects

Out of total 252 studied subjects 227 (90%) were already diagnosed cases of hypertension and were on

treatment. Total 25 (9.9%) of 252 patients were newly diagnosed (<1 year) after the age of 60 years (Figure.1). When we analyzed the duration of hypertension in diagnosed elderly hypertensive subjects, we found that 64.2% patients had duration from 2-10 years.

In the study reported by Dwivedi et al^[5], 63.46% of patients were known cases of hypertension. Our results are comparable to the study by Vrinda Kulkarni et al^[12] who reported 88.2% of known elderly hypertensive patients.

In our study, we found that 32.1% patients of > 1-5 years of duration of hypertension as compared to study reported by Vrinda Kulkarni et al^[12] who reported 41.1%. In their study, 5.1% patients reported to have hypertension >10 years and in our study 25.8% patients had > 10 years of hypertension.

Symptoms in elderly hypertensive subjects

Hypertension is well known “Silent Killer” and is asymptomatic in significantly high number of patients. When we analyzed presenting symptom in elderly subjects, we found that 16.3% of patients had no symptoms. Giddiness was commonest symptom found in 141 out of 252 (55.8%) subjects followed by headache in 90 out of 252 (35.6%) subjects (Table. 2).

In the study reported by Vrinda Kulkarni et al^[12] 24 patients i.e. 17.6% were asymptomatic and they presented headache as more common symptom in 77.9%. 17.5% (45 out of 252) had more than 1 symptom.

Associated co morbidities in elderly Hypertensive subjects

In our study we found that out of 252 patients, 61 (24.1%) subjects were having diabetes mellitus as co morbidity (Table 3). Obesity was the commonest co morbid condition in our study which was seen in 122

out of 252 subjects (48.4%) and 53 patients i.e. 21% subjects were overweight. So considering overweight and obesity both, 69.4% (175 out of 252) subjects were having high BMI (>23 kg/m²) as per ICMR standards for Indian population and remaining 29 % of subjects were having normal BMI. In our study 20.2% i.e. 51 of subjects were having abnormal waist circumference in which females outnumbered males.

In the study reported by Vrinda kulkarni et al^[12] 31.6% were diabetic and in study by Dwivedi et al^[5] 31.4% were diabetic. In same study 16.9% subjects were obese. In the study reported by Hazarika et al^[13] 10.8% of elderly hypertensive were obese.

In our study dyslipidemia was seen in 31.3% (79 out of 252) of subjects, of which 67.1% (53 out of 79) were females. Out of these 31.3% (79 out of 252) dyslipidemic, 53.2% i.e. 42 of 79 had hypercholesterolemia, 17.8% i.e. 14 of 79 had hypertriglyceridemia and both was seen in 29% i.e. 23 of patients (Table 3).

In the study reported by Vrinda kulkarni et al^[12] dyslipidemia was seen in 55.9% of patients with female preponderance.

End Organ Damage in elderly hypertensive subjects

In our study we found that 18.3% (46 out of 252) were having LVH on ECG, 3.6% had LVF, 2% were having IHD (UA/MI) and 1.2% had arrhythmias (Table 3). 4% (10 out of 252) subjects were having cerebrovascular involvement in form of strokes (80%) and TIA (20%) (Table 3). Hypertensive retinopathy (by KWR grading) was seen in 13.6% (35 out of 252) of subjects of whom 75% (27 out of 35) in grade 1 followed by 7 and 2 patients in grade 2 and 3 respectively. 10.4 % (26 out of 252) subjects were having renal involvement in form of raised

creatinine (16 out of 252 i.e.6.3%) and shrunken kidney sizes (8 out of 252 i.e.3.2%) with 2 patients having both .

In the study reported by Vrinda kulkarni et al^[12] LVH was the commonest ECG manifestation seen in 36.8% patients and in Dwivedi et al^[5] study 12.8 % of patients had LVH on ECG. In study by Vrinda Kulkarni et al^[12] 23.5% subjects were having cerebrovascular complication in the form of stroke. In same study grade 2-hypertensive retinopathy was observed in 29.4% with uncontrolled HTN.

Frequency of co morbidities in elderly hypertensive subjects

In our study we found that 39.3% of subjects (99 out of 252) had one co morbid condition along with HTN. 26.6% of subjects (67 out of 252) were having two co morbidities, 10.3% (26 out of 252) had 3 co morbidities and 4 patients had four co morbidities and 4 had five co morbidities. 20.6 % of subjects (52 out of 252) were not having a single co morbid condition apart from HTN.

Dwivedi et al^[5] found that HTN alone was found in 31 (19.9%) subjects only, which is comparable to our study.

Antihypertensive therapy in elderly hypertensive subjects

In our study Calcium channel blockers were most commonly used drug and they were used in 78.2% of subjects (197 out of 252) Pedal edema was seen in 8.6% of subjects (17 out of 197) in which CCB (amlodipine) was used. ACE inhibitors induced dry cough was seen in 15.4% of subjects (6 out of 39 patients) in our study.

In the study reported by Vrinda kulkarni et al^[12] calcium channel blocker was most common drug used for treatment in 67.6% patients. Edema feet was seen in 5.9% of patients in which CCB were used.

Similarly dry cough was seen in 5.9% of patients in which ACE inhibitors were used.

In our study we found 44.8 % of subjects (113 out of 252) were on monotherapy. Two drugs were used in 38.9% of subjects (98 out of 252) . Three drugs were required in 14.3% of subjects (36 out of 252). 5 patients were on 4 antihypertensive drugs. Out of 252 subjects 8.3 % i.e. 21 were noncompliant to therapy.

Gender wise correlation of various parameters

We further analyzed the differences between male and female elderly hypertensive subjects by applying student's t test. Waist circumference and waist to height ratio between males and females were statistically significant. Mean waist circumference was more in males (p value: 0.001) and waist to height ratio was more in females (p value:0.001)(Table 4). Mean hemoglobin level (Females: 11.7gm%, Males: 12.8gm%) was on lower side for females with statistically significant difference when compared with males (p value:0.001). Fasting and post lunch sugars were higher in females. Mean creatinine level was higher in males. Total cholesterol was significantly higher in females as compared with males (Females 192.2 gm%, males 178.1gm%)(p value:0.008)(Table 4) .There was no statistically significant difference in Ankle Brachial Pressure Index.

Age Group wise correlation of various parameters

We further analyzed the studied population with respect to 3 age groups namely 60-65years,66-70 years, >70 years by using ANOVA test. In our study we found that BMI falls as age increases which was statistically significant (p value:0.018) in 3 age groups (60-65 years, 60-65 years, >70 years). In other anthropometric parameters there was no statistical difference in various age groups.

Limitations of our study:

This study was conducted in a specialty hypertension clinic of a tertiary care hospital in a metropolitan city, hence the observation and conclusions of this study cannot be extrapolated to the general population, especially those from rural areas.

Conclusion:

Understanding the prevalence of hypertension and their associated risk factors along with an increasing

burden of its epidemic in India, it is imperative to manage elderly hypertensive effectively and to regularly screen these patients for associated co-morbidities and the end organ damages. Lifestyle and dietary changes leading to metabolic derangements is increasing prevalence of hypertension in elderly female.

Table.1: Age group and gender distribution of Elderly hypertensive subjects (N=252)

Age group (Years)	Males N (%)	Females N (%)	Total N (%)
60 to 65	54(37.8%)	89 (62.2%)	143 (56.7%)
66 to 70	21 (41.2%)	30 (58.8%)	51 (20.2%)
71 to 75	25 (64.1%)	14 (35.9%)	39 (15.6%)
76to 80	3 (37.5%)	5 (62.5%)	8 (3.1%)
81 to 85	6(60%)	4 (40%)	10 (4%)
86 to 90	1 (100%)	0 (0%)	1 (0.4%)
Total	110(43.7%)	142(56.7%)	252(100%)

Table 2: Presenting symptoms of Elderly Hypertensive Subjects (N=252)

Symptoms	Males N (%)	Females N (%)	Total N (%)
Giddiness	54 (38.3%)	87 (61.7%)	141 (55.8%)
Headache	39 (43.3%)	51 (56.7%)	90 (35.6%)
Asymptomatic	22 (53.7%)	19 (46.3%)	41 (16.3%)

Chest Pain	10 (77.1%)	3 (22.9%)	13 (5.6%)
Sweating	7 (70%)	3 (30%)	10(4%)

Table 3 : Comparison of co morbidities and end organ damage in elderly hypertensive subjects in various studies.

Co morbidities	V Kulkarni et al (2001)	Dwivedi et al (1997)	Our study (2014)
Female : Male ratio	0.76 : 1	0.69 : 1	1.3 : 1
DM	31.6%	31.4%	24.1%
Obesity	-----	16.9%	48.4%
Dyslipidemia	55.9%	----	31.3%
LVH	36.8%	12.8%	18.3%
CVA	23.4%	----	4%
Retinopathy	29.4%	----	13.6%

Table 4: Gender wise correlation of anthropometric measures and laboratory parameters in Elderly Hypertensive subjects (N=252)

Sr. No.	Parameter		Male	Female	Test of Sig. (t test)	P Value
1	Height (cms)	Mean	160.3	149.8	13.1	0.000
		SD	6.2	6.3		
2	Weight (Kgs)	Mean	63.5	56.5	5.6	0.000
		SD	9.8	10.0		
3	BMI (kg/m ²)	Mean	24.6	25.4	-1.1	0.277
		SD	3.5	3.9		
4	Waist Circumference (cms)	Mean	89.9	85.9	3.5	0.001
		SD	9.5	8.6		
5	Waist to Height Ratio	Mean	0.56	0.58	-2.1	0.001
		SD	0.06	0.08		
6	Hemoglobin (gm /dl)	Mean	12.8	11.7	5.2	0.000
		SD	1.7	1.5		
7	Fasting Sugar(mg/dl)	Mean	105.8	114.4	-1.9	0.057

		SD	20.3	43.8		
8	Post Lunch Sugar (mg/dl)	Mean	125.2	126.8	-0.25	0.797
		SD	34.4	57.8		
9	Creatinine (mg/dl)	Mean	1.1	1.0	0.26	0.004
		SD	0.3	0.3		
10	Total Cholesterol (mg/dl)	Mean	178.1	192.2	-2.7	0.008
		SD	40.1	42.3		

Figure 1: Gender wise duration of hypertension In Elderly Subjects (N = 252)

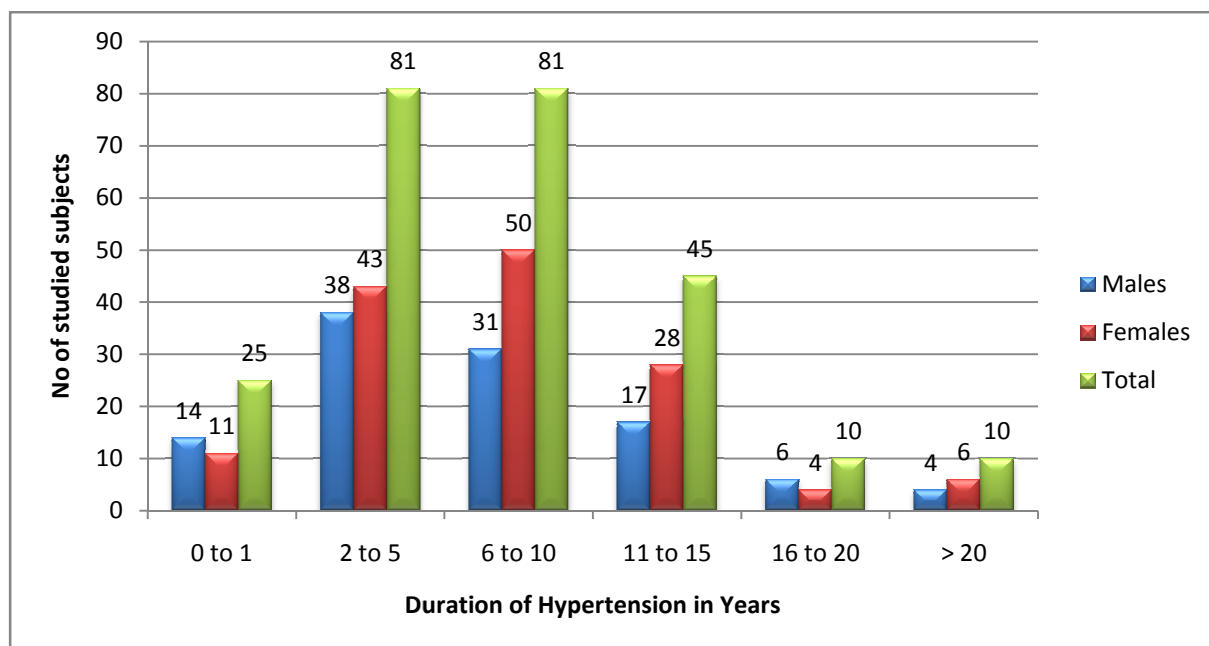


Fig 2: Number of Antihypertensive drugs in Elderly Hypertensive Subjects (N =252)

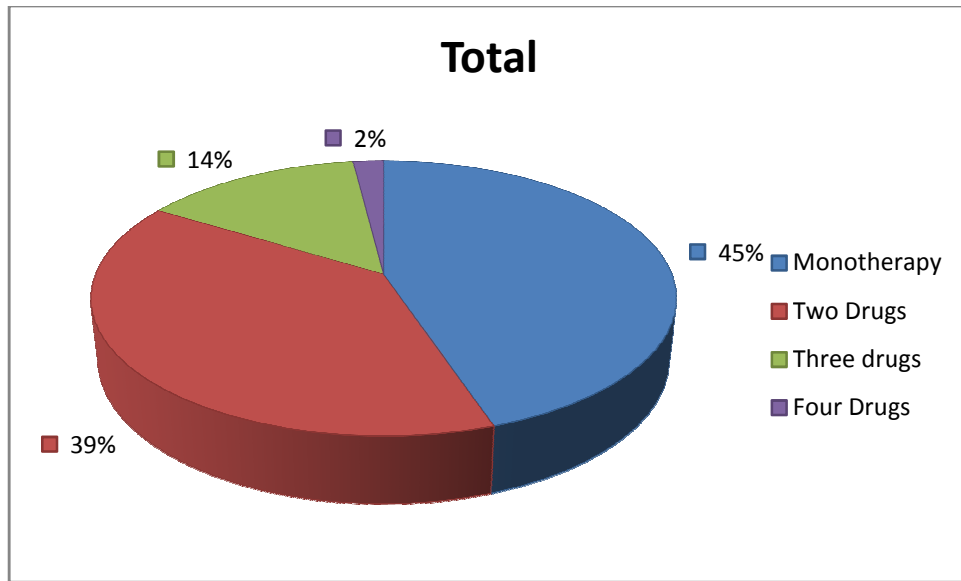


Figure 3: Presenting symptoms of Elderly Hypertensive Subjects (N=252)

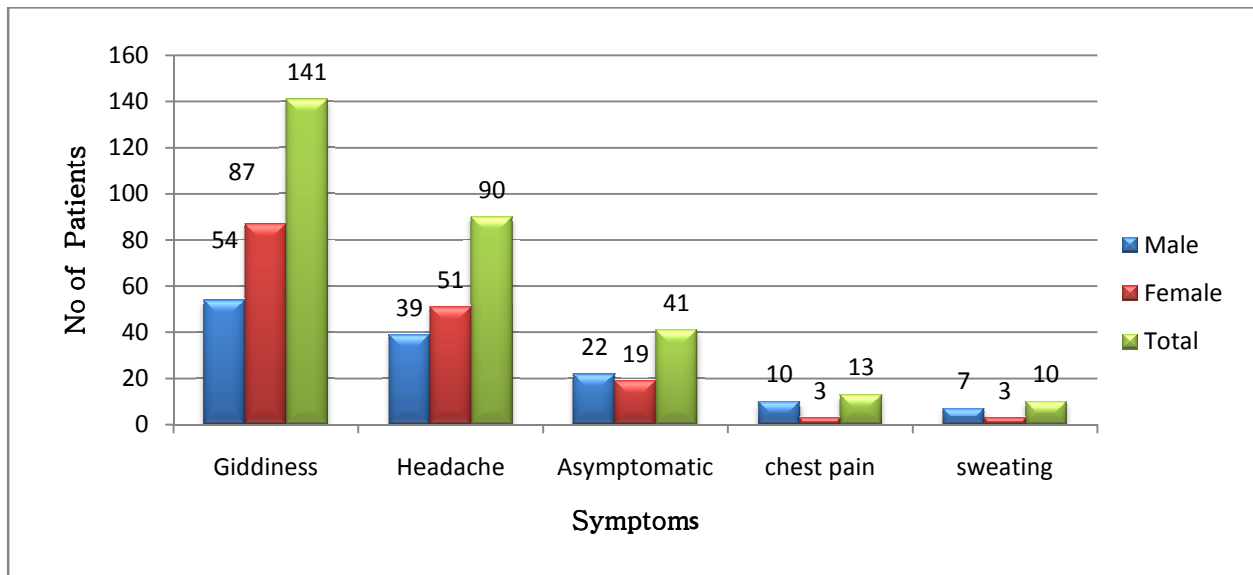
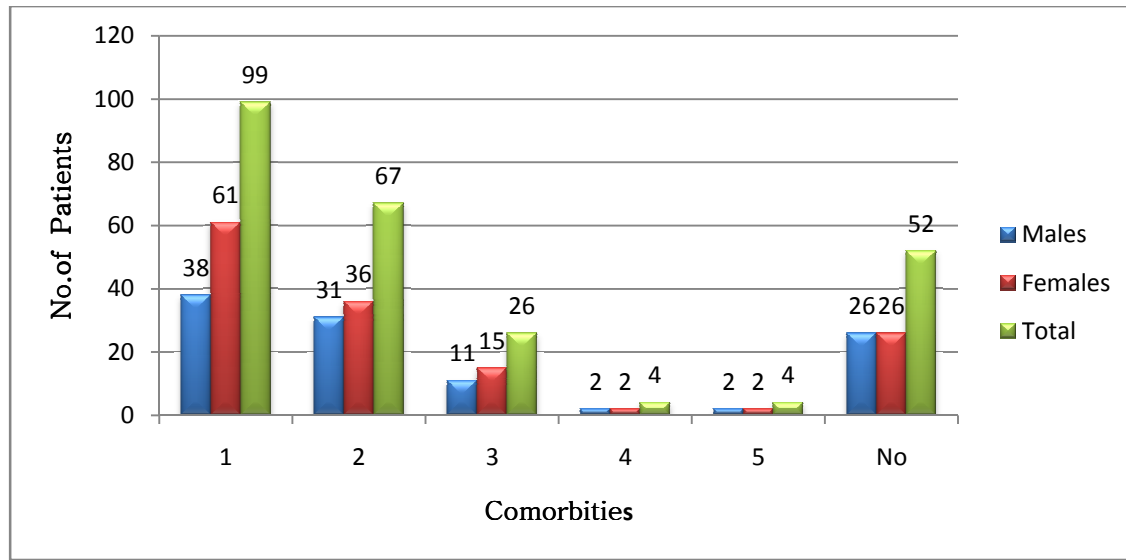


Figure 4: Frequency of Co- morbidities in Elderly Hypertensive Subjects (N=252)



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