

Prevalence of Clinical Signs and Symptoms of Hypertension: A Gender and Age Based Comparison

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Abstract

Objective: To compare the prevalence of clinical signs and symptoms of hypertension among different gender and age based groups of hypertensive patients.

Materials and Methods: A cross-sectional study was conducted with 372 patients aged 18 or above with self-reported history of hypertension and on anti-hypertensive medication. It was a multicenter study performed in urban health center and Myanmar health center for duration of 6 months from June 2017 till November 2017. Hypertension associated signs and symptoms were evaluated with the help of a questionnaire and clinical examination. Blood pressure was measured using sphygmomanometer with stethoscope.

Results: A higher percentage of males were smokers (18.2% vs. 1.4%) and gave a positive history of chest pain (49.3% vs. 38.2%), though a higher percentage of females gave a positive history of vision problems (57.0% vs. 49.3%), fatigue (74.8% vs. 70.3%) and confusion (66.7% vs. 60.6%). Moreover, a higher percentage of ≤40 years old patients gave a positive history of headache (80.7% vs. 69.4%) though a higher percentage of >40 years old patients were smokers (12.0% vs. 4.7%), gave a positive history of vertigo (59.3% vs. 47.7%), chest pain (49.3% vs. 32.2%), vision problems (57.4% vs. 44.2%), dyspnea (57.4% vs. 43.8%), increase in urinary frequency (45.5% vs. 30.6%), nausea (25.4% vs. 20.5%), sleep apnea (38.6% vs. 20.5%), irregular heartbeat/palpitation (39.9% vs. 33.0%), fatigue (74.8% vs. 67.0%) and confusion (68.6% vs. 52.3%).

Conclusion: The prevalence of smoking, chest pain, vision problems, fatigue and confusion were found to be different between both genders. Furthermore, the prevalence of smoking, headache, vertigo, chest pain, vision problems, dyspnea, increased urinary frequency, nausea, sleep apnea, irregular heartbeat/palpitation, fatigue and confusion were found to be different between both age groups.

Key words: Prevalence; Signs and Symptoms; Hypertension; Gender; Age

Introduction

Hypertension is regarded as an important public health challenge worldwide because of its high prevalence. [1,2] It is known to increase the risk of various medical conditions such as heart attack, stroke, kidney failure and blindness. [3] The

Comparative Risk Assessment Collaborating Group has identified hypertension as the third leading risk factor for morbidity and as the leading risk factor for mortality worldwide. [4] More than a quarter of the world's adult population has been reported to suffer from hypertension, two thirds of which belong to developing countries. [5] According to World Health Organization

estimates, hypertension annually results in 7.5 million deaths. [3]

An analysis of global data revealed that the overall prevalence of hypertension is similar in both genders, and that it consistently increases with age worldwide. [5] A meta-analysis earlier reported 17% of the Pakistani population to be suffering from hypertension. [6] The World Health Organization recently estimated that 25.2% of the Pakistani population had high blood pressure. [7]

Hypertension is defined as a systolic blood pressure of ≥ 140 mm Hg, or a diastolic blood pressure of ≥ 90 mm Hg, or taking antihypertensive medication. [8] Hypertension can be of two types, essential and secondary. Essential hypertension can be defined as a rise in blood pressure of unknown cause that increases risk for cerebral, cardiac, and renal events. [9] Secondary hypertension is defined as increased systemic blood pressure due to an identifiable cause. [10]

Multiple factors such as age, gender, and level of high blood pressure can influence the way in which hypertension presents itself clinically but literature does not reveal substantial relevant data, both internationally and locally, making the task of assessing the effects of above mentioned factors in the clinical manifestation of hypertension difficult. Our objective therefore was to compare the prevalence of clinical signs and symptoms of hypertension among different gender and age based groups of hypertensive patients.

Materials and Methods

After taking ethical approval, a cross-sectional study was carried out among patients with self-reported history of hypertension and on anti-hypertensive medication. It was a multicenter study performed in Urban health center and Myanmar health center for a duration of 6 months from June 2017 till November 2017. By employing convenient sampling technique, a total of 372 patients aged 18 or above were included in the study. Patients with history of diabetes, cardiac events, neurological disorders, cluster headache, gastrointestinal disease, visual problems, epistaxis before being diagnosed with hypertension and morbid obesity were excluded from the study.

A detailed history was taken from each patient about hypertension associated symptoms with the help of a structured questionnaire. The questionnaire was designed based on 12 major or most frequently encountered symptoms by the hypertensive patients. The site, duration, and severity of each symptom were documented. Each symptom was graded from mild to severe to assess the severity of the symptoms. The presence of edema was noted with its laterality and grading. The appearance of chest pain was noted with its severity. The problems of vision were noted and classified according to the loss in field of vision. The history of epistaxis and urinary symptoms were noted with frequency. Few additional symptoms such as nausea, sleep apnea, palpitations, fatigue and confusion were also assessed subjectively. Blood pressure was measured using sphygmomanometer with stethoscope to assess hypertension level.

The collected data were coded, entered and analyzed on SPSS

version 20. The descriptive analysis was performed by calculating means and standard deviations for continuous variables and frequencies and percentages for categorical variables. The duration of study was 6 months.

Results

The total data collected were of 372 patients but after excluding missing data for various study variables the final data analyzed were of 303 patients for gender wise comparison and of 299 patients for age wise comparison.

For gender wise comparison, the study results revealed that the mean age of male patients was slightly higher than that of female patients (50.36 ± 11.93 years vs. 46.74 ± 12.93 years) and therefore a higher percentage of them was above 40 years of age (79.9% vs. 60.0%). An almost equal percentage of both males and females had systolic hypertension (68.0% and 65.9% respectively) though the percentage of diastolic hypertension was slightly higher in females (53.1% vs. 48.1%). Both males and females had similar mean systolic blood pressure (141.13 ± 13.94 mm Hg and 141.67 ± 15.35 mm Hg respectively) though the mean diastolic blood pressure was slightly higher in females (86.09 ± 9.65 mm Hg vs. 84.43 ± 10.71 mm Hg). Both males and females had similar mean duration of hypertension as well (4.86 ± 5.39 years and 4.78 ± 5.39 years respectively). A much higher percentage of males were smokers (18.2% vs. 1.4%) though a slightly higher percentage of females gave a positive history of headache (75.3% vs. 70.8%). The mean duration of headache was found to be equal in both males and females (1.96 ± 0.75 years and 1.96 ± 0.68 years respectively) and the most common site of headache was similar in both genders as well i.e. complete headache (37.0% and 26.6% respectively). A majority of males reported their headache to be of moderate intensity whereas a majority of females reported it to be of severe intensity (53.7% and 41.4% respectively). An equal majority of both males and females gave a positive history of vertigo (55.0% and 55.9% respectively) and a majority of both genders reported it to be of mild intensity (60.4% and 65.0% respectively). An almost similar percentage of both males and females were found to have edema (40.5% and 43.0% respectively), a very high percentage of which was bilateral in both gender (84.6% and 80.4% respectively). The grading of bilateral edema of an almost similar percentage of both males and females was found to be severe (35.0% and 36.5% respectively). A higher percentage of males gave a positive history of chest pain (49.3% vs. 38.2%) though a higher percentage of females required a hospital visit for it to subside (16.4% vs. 5.4%). A higher percentage of females gave a positive history of vision problems (57.0% vs. 49.3%) though the most common type of vision problem was dark spots in field of vision in both males and females (47.9% and 45.0% respectively). A similar percentage of both males and females gave a positive history of dyspnea (53.0% and 52.7% respectively) and a majority of both genders reported it to be moderate in intensity (57.3% and 48.1% respectively). A very low percentage of both males and females gave a positive history of epistaxis (2.6% and 3.5% respectively). A slightly higher percentage of males reported an increase in urinary frequency (44.0% vs. 38.3%) though a majority of both

males and females reported the change to be moderate (42.7% and 40.4% respectively). A slightly higher percentage of females gave a positive history of nausea (25.9% vs. 22.1%) whereas a slightly higher percentage of males gave a positive history of sleep apnea (34.2% vs. 32.0%). An almost similar percentage of both

males and females gave a positive history of irregular heartbeat/palpitation (38.3% and 37.0% respectively) though a higher percentage of females gave a positive history of both fatigue (74.8% vs. 70.3%) and confusion (66.7% vs. 60.6%) (Table 1).

Table 1: Descriptive Analysis: Gender wise comparison

Variables		Males (n=156)	Females (n=147)
		Frequency(%)/ Mean±S.D.	Frequency(%)/ Mean±S.D.
Age (Years)		50.36±11.93	46.74±12.93
Age Group	≤40 Years	31(20.1)	58(40.0)
	>40 Years	123(79.9)	87(60.0)
Systolic Blood Pressure	Normotensive/ Prehypertensive	50(32.0)	50(34.1)
	Stage 1/Stage 2 Hypertensive	106(68.0)	97(65.9)
Diastolic Blood Pressure	Normotensive/ Prehypertensive	81(51.9)	69(46.9)
	Stage 1/Stage 2 Hypertensive	75(48.1)	78(53.1)
Systolic Blood Pressure (mmHg)		141.13±13.94	141.67±15.35
Diastolic Blood Pressure (mmHg)		84.43±10.71	86.09±9.65
Hypertension Duration (Years)		4.86±5.39	4.78±5.39
Smoking	Yes	28(18.2)	2(1.4)
	No	126(81.8)	142(98.6)
Headache	Yes	109(70.8)	110(75.3)
	No	45(29.2)	36(24.7)
Headache Duration (Years)		1.96±0.75	1.96±0.68
Site of Headache	Temporal	5(4.6)	18(16.5)
	Parietal	17(15.7)	12(11.0)
	Occipital	27(25.0)	24(22.0)
	Frontal	19(17.6)	26(23.9)
	Complete	40(37.0)	29(26.6)
Intensity of Headache	Mild	25(23.1)	28(25.3)
	Moderate	58(53.7)	37(33.3)
	Severe	25(23.1)	46(41.4)
Vertigo	Yes	83(55.0)	80(55.9)
	No	68(45.0)	63(44.1)
Intensity of Vertigo	Mild	52(60.4)	52(65.0)
	Moderate	28(32.6)	22(27.5)
	Severe	6(7.0)	6(7.5)
Edema	Yes	60(40.5)	58(43.0)
	No	88(59.5)	77(57.0)
Laterality of Edema	Bilateral	44(84.6)	45(80.4)
	Unilateral	8(15.4)	11(19.6)

Grading of Bilateral Edema	Mild	16(26.7)	10(15.9)
	Moderate	23(38.3)	30(47.6)
	Severe	21(35.0)	23(36.5)
Chest Pain	Yes	75(49.3)	55(38.2)
	No	77(50.7)	89(61.8)
Severity of Chest Pain	Improves with rest	29(39.2)	23(41.8)
	Needs pain relieving medication	41(55.4)	23(41.8)
	Requires hospital visit	4(5.4)	9(16.4)
Vision Problems	Yes	75(49.3)	81(57.0)
	No	77(50.7)	61(43.0)
Type of Vision Problem	Loss of central vision	7(9.6)	5(6.3)
	Loss of peripheral vision	14(19.2)	20(25.0)
	Dark spots in field of vision	35(47.9)	36(45.0)
	Pain in eyes	17(23.3)	19(23.8)
Dyspnea	Yes	80(53.0)	77(52.7)
	No	71(47.0)	69(47.3)
Intensity of Dyspnea	Mild	14(17.1)	13(16.8)
	Moderate	47(57.3)	37(48.1)
	Severe	21(25.6)	27(35.1)
Epistaxis	Yes	4(2.6)	5(3.5)
	No	148(97.4)	139(96.5)
Increased Urinary Frequency	Yes	66(44.0)	54(38.3)
	No	84(56.0)	87(61.7)
Change in Urinary Frequency	Mild	25(33.3)	17(29.8)
	Moderate	32(42.7)	23(40.4)
	Severe	18(24.0)	17(29.8)
Nausea	Yes	34(22.1)	38(25.9)
	No	120(77.9)	109(74.1)
Sleep Apnea	Yes	53(34.2)	47(32.0)
	No	102(65.8)	100(68.0)
Irregular Heartbeat/ Palpitation	Yes	59(38.3)	54(37.0)
	No	95(61.7)	92(63.0)
Fatigue	Yes	109(70.3)	110(74.8)
	No	46(29.7)	37(25.2)
Confusion	Yes	94(60.6)	98(66.7)
	No	61(39.4)	49(33.3)

For age wise comparison, the study results revealed that a higher percentage of patients in >40 years age group were males (58.6% vs. 34.8%). A higher percentage of >40 years old patients had systolic hypertension (72.4% vs. 52.8%) though the percentage of diastolic hypertension was equal in both ≤40 years and >40 years age groups (49.5% and 50.0% respectively). Both

the mean systolic and diastolic blood pressures were higher in >40 years age group (142.85±14.44 mm Hg vs. 137.69±14.70 mm Hg and 85.46±10.57 mm Hg vs. 84.36±9.47 mm Hg respectively). The mean duration of hypertension was higher in >40 years age group as well (5.66±5.78 years vs. 2.85±3.74 years). A higher percentage of >40 years old patients were smokers (12.0% vs.

4.7%) where as a higher percentage of ≤40 years old patients gave a positive history of headache (80.7% vs. 69.4%). The mean duration of headache was found to be higher in >40 years old patients(2.01±0.74 years vs. 1.87±0.64 years) whereas the most common sites of headache were occipital and complete in both ≤40 years (27.5% each) and >40 years age groups (19.4% and 34.7% respectively).A majority of patients in both ≤40 years and >40 years age groups reported their headache to be of moderate intensity (35.7% and 46.9% respectively). A higher percentage of patients in >40 years age group gave a positive history of vertigo (59.3% vs. 47.7%) whereas a majority of patients in both ≤40 years and >40 years age groups reported it to be of mild intensity (66.7% and 61.8% respectively). An almost similar percentage of both≤40 years and >40 years old patients were found to have edema (40.2% and 42.6% respectively), a very high percentage of which was bilateral in both age groups (76.7% and 84.6% respectively). The grading of bilateral edema of a majority of both ≤40 years and >40 years age groups was found to be moderate (45.7% and 41.4% respectively). A higher percentage of >40 years old patients gave a positive history of chest pain (49.3%

vs. 32.2%) though a higher percentage of ≤40 years old patients required a hospital visit for it to subside (22.2% vs. 6.9%). A higher percentage of >40 years old patients gave a positive history of vision problems (57.4% vs. 44.2%) though the most common type of vision problem was dark spots in field of vision in both ≤40 years and >40 years age groups (46.2% and 46.0% respectively). A higher percentage of >40 years old patients gave a positive history of dyspnea (57.4% vs. 43.8%) though a majority of patients in both ≤40 years and >40 years age groups reported it to be moderate in intensity (48.8% and 53.8% respectively).A very low percentage of both ≤40 years and >40 years old patients gave a positive history of epistaxis (2.4% and 3.4% respectively). A higher percentage of patients in >40 years age group reported an increase in urinary frequency (45.5% vs. 30.6%) though a majority of patients in both ≤40 years and >40 years age groups reported the change to be moderate (36.7% and 44.0% respectively). A higher percentage of patients in >40 years age group gave a positive history of nausea (25.4% vs. 20.5%), sleep apnea (38.6% vs. 20.5%), irregular heartbeat/palpitation (39.9% vs. 33.0%), fatigue (74.8% vs. 67.0%) and confusion (68.6% vs. 52.3%) (Table 2).

Table 2: Descriptive Analysis: Age wise comparison

Variables		≤40 Years (n=89)	>40 Years (n=210)
		Frequency(%)/ Mean±S.D.	Frequency(%)/ Mean±S.D.
Gender	Male	31(34.8)	123(58.6)
	Female	58(65.2)	87(41.4)
Systolic Blood Pressure	Normotensive/ Prehypertensive	42(47.2)	58(27.6)
	Stage 1/Stage 2 Hypertensive	47(52.8)	152(72.4)
Diastolic Blood Pressure	Normotensive/ Prehypertensive	45(50.5)	105(50.0)
	Stage 1/Stage 2 Hypertensive	44(49.5)	105(50.0)
Systolic Blood Pressure (mmHg)		137.69±14.70	142.85±14.44
Diastolic Blood Pressure (mmHg)		84.36±9.47	85.46±10.57
Hypertension Duration (Years)		2.85±3.74	5.66±5.78
Smoking	Yes	4(4.7)	25(12.0)
	No	82(95.3)	183(88.0)
Headache	Yes	71(80.7)	145(69.4)
	No	17(19.3)	64(30.6)
Headache Duration (Years)		1.87±0.64	2.01±0.74
Site of Headache	Temporal	7(10.1)	16(11.1)
	Parietal	6(8.8)	23(16.0)
	Occipital	19(27.5)	28(19.4)
	Frontal	18(26.1)	27(18.8)
	Complete	19(27.5)	50(34.7)
Intensity of Headache	Mild	23(32.9)	30(20.7)
	Moderate	25(35.7)	68(46.9)
	Severe	22(31.4)	47(32.4)

Vertigo	Yes	41(47.7)	121(59.3)
	No	45(52.3)	83(40.7)
Intensity of Vertigo	Mild	28(66.7)	76(61.8)
	Moderate	12(28.6)	38(30.9)
	Severe	2(4.8)	9(7.3)
Edema	Yes	33(40.2)	84(42.6)
	No	49(59.8)	113(57.4)
Laterality of Edema	Bilateral	23(76.7)	66(84.6)
	Unilateral	7(23.3)	12(15.4)
Grading of Bilateral Edema	Mild	6(17.1)	20(23.0)
	Moderate	16(45.7)	36(41.4)
	Severe	13(37.1)	31(35.6)
Chest Pain	Yes	28(32.2)	101(49.3)
	No	59(67.8)	104(50.7)
Severity of Chest Pain	Improves with rest	13(48.2)	39(38.6)
	Needs pain relieving medication	8(29.6)	55(54.5)
	Requires hospital visit	6(22.2)	7(6.9)
Vision Problems	Yes	38(44.2)	117(57.4)
	No	48(55.8)	87(42.6)
Type of Vision Problem	Loss of central vision	1(2.5)	11(9.7)
	Loss of peripheral vision	11(28.2)	23(20.4)
	Dark spots in field of vision	18(46.2)	52(46.0)
	Pain in eyes	9(23.1)	27(23.9)
Dyspnea	Yes	39(43.8)	117(57.4)
	No	50(56.2)	87(42.6)
Intensity of Dyspnea	Mild	9(22.0)	18(15.4)
	Moderate	20(48.8)	63(53.8)
	Severe	12(29.2)	36(30.8)
Epistaxis	Yes	2(2.4)	7(3.4)
	No	83(97.6)	200(96.6)
Increased Urinary Frequency	Yes	26(30.6)	92(45.5)
	No	59(69.4)	110(54.5)
Change in Urinary Frequency	Mild	10(33.3)	32(32.0)
	Moderate	11(36.7)	44(44.0)
	Severe	9(30.0)	24(24.0)
Nausea	Yes	18(20.5)	53(25.4)
	No	70(79.5)	156(74.6)
Sleep Apnea	Yes	18(20.5)	81(38.6)
	No	70(79.5)	129(61.4)
Irregular Heartbeat/ Palpitation	Yes	29(33.0)	83(39.9)
	No	59(67.0)	125(60.1)
Fatigue	Yes	59(67.0)	157(74.8)
	No	29(33.0)	53(25.2)
Confusion	Yes	46(52.3)	144(68.6)

Discussion

The study results revealed that a much higher percentage of males were smokers though the most common site of headache was similar in both genders i.e. complete headache. A majority of males reported their headache to be of moderate intensity whereas a majority of females reported it to be of severe intensity. A higher percentage of males gave a positive history of chest pain though a higher percentage of females required a hospital visit for it to subside. A higher percentage of females gave a positive history of vision problems though the most common type of vision problem was dark spots in field of vision in both genders. A higher percentage of females gave a positive history of both fatigue and confusion.

The study results further revealed that a higher percentage of >40 years old patients were smokers whereas a higher percentage of ≤40 years old patients gave a positive history of headache. The mean duration of headache was found to be higher in >40 years old patients though the most common sites of headache were occipital and complete in both age groups. A higher percentage of patients in >40 years age group gave a positive history of vertigo and chest pain though a higher percentage of ≤40 years old patients required a hospital visit for their chest pain to subside. A higher percentage of >40 years old patients gave a positive history of vision problems though the most common type of vision problem was dark spots in field of vision in both age groups. A higher percentage of >40 years old patients gave a positive history of dyspnea and reported an increase in urinary frequency. A higher percentage of patients in >40 years age group gave a positive history of nausea, sleep apnea, irregular heartbeat/palpitation, fatigue and confusion as well.

The study results revealed that both males and females had almost equal levels of systolic and diastolic blood pressures, though Dustan HP in 1996 reported males to have higher blood pressure levels than females, albeit slightly. [11] Likewise, Daugherty SL et al., in 2011 also reported males to have lower rates of hypertension control than females. [12] This difference in findings could be a result of several factors, such as gender specific age structure and compliance rate of the populations in question. The study results further revealed that the patients in >40 years age group had higher levels of systolic and diastolic blood pressures, a finding well in line with published literature as Jo I et al., in 2001 also reported age to be associated with prevalence of hypertension. [13]

Moreover, a very high percentage of study participants gave a positive history of headache, irrespective of their gender or age. Similarly, D Tullio M et al., in 1988 also reported headache to be more prevalent in hypertensive than normotensive subjects. [14] Literature though reveals contrary findings as well as reported by Fuchs FD et al., in 2003 and Sherif SM et al., in 2012. [15,16] This difference in findings could well be attributed to different methodologies of the studies in question.

The study results further showed that vision problems were more prevalent among patients who were female or of older age in the study. Sherif SM et al., in 2012 did not report visual

disturbances to be associated with hypertension, though without consideration for the gender or age of the study participants. [16] Furthermore, a higher percentage of >40 years old patients gave a positive history of dyspnea in the study. Karras DJ et al., in 2005 reported dyspnea to be associated with elevated blood pressure though irrespective of the age of the study participants. [17] Due to dearth of pertinent published literature, a meaningful comparison could not be made for the study findings mentioned above.

Moreover, a very low percentage of study participants gave a positive history of epistaxis, irrespective of their gender or age. Likewise, D Tullio M et al., in 1988 also did not find epistaxis to be associated with hypertension. [14] Furthermore, a very high percentage of study participants gave a positive history of fatigue, again irrespective of their gender or age. Unlike the study results though, D Tullio M et al., in 1988 did not report weakness to be associated with hypertension. [14] Due to lack of relevant published data, a comparison of the rest of study findings could not be made with the previous literature.

Limitation and Recommendation

It is acknowledged that being a cross-sectional study, recall bias may have affected the study results. Because of their potential to effect the clinical manifestation of hypertension, further evaluation of the role of gender and age in hypertension screening and management is recommended.

Conclusion

The study results revealed that the prevalence of smoking, chest pain, vision problems, fatigue and confusion were different between both genders. Furthermore, the prevalence of smoking, headache, vertigo, chest pain, vision problems, dyspnea, increased urinary frequency, nausea, sleep apnea, irregular heartbeat/palpitation, fatigue and confusion were different between both age groups.

Conflict of Interests

The authors report no conflict of interests.

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