

Hypertension and Dyspnea: Role of Age and Hypertension Duration

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ABSTRACT

Objective: Examination of the relation of age and hypertension duration on relationship between hypertension with dyspnea.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Anatomy and Medicine Shahida Islam Medical Complex, Lodhran January 2018 to July 2018.

Materials and Methods: A cross-sectional study was conducted in the outpatient division after taking ethical approval from Shahida Islam Medical Complex, Lodhran. The inclusion criteria of the study were 18 years or above age, either gender, having history of hypertension which was self-reported or intake of anti-hypertensive medication. After analyzing the capability and obtaining oral informed consent, all the demographic statistics and hypertension related clinical signs and symptoms were recorded through interview by using a structured questionnaire whereas the blood pressure levels were measured by a sphygmomanometer with stethoscope. Chi-square test was used for inferential analysis whereas the significant level was placed at 0.05.

Results: The study results showed that overall dyspnea was not notably related with systolic and diastolic hypertension but among patients aged up to 35 years it was notably related with diastolic hypertension ($p=0.016$) while among patients aged 56 years or above it was markedly related with systolic hypertension ($p=0.016$). Moreover, among patients with 10 years or more duration of hypertension it was remarkably related with systolic hypertension ($p=0.037$).

Conclusion: According to the study findings it is established that both age and hypertension duration modify the relationship between hypertension and dyspnea. While deciding the management plan for hypertensive patients, the role of their age and hypertension duration should not be ignored.

Key Words: Hypertension, Dyspnea, Age Groups.

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INTRODUCTION

Hypertension has been defined as a systolic blood pressure (SBP) of 140 mm Hg or above, or a diastolic blood pressure (DBP) of 90 mm Hg or above, or on antihypertensive medication.¹

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As per the suggestion of the seventh report of the Joint National Committee on elimination, recognition, assessment, and management of hypertension (JNC 7), blood pressure for adults aged 18 years or above has been categorized as normal, prehypertension, stage 1 hypertension and stage 2 hypertension: Normal (systolic < 120 mm Hg, diastolic < 80 mm Hg); Prehypertension (systolic 120-139 mm Hg, diastolic 80-89 mm Hg); Stage 1 Hypertension (systolic 140-159 mm Hg, diastolic 90-99 mm Hg) and Stage 2 Hypertension (systolic 160 mm Hg or greater, diastolic 100 mm Hg or greater).² There are two categories of hypertension: Primary/Essential and Secondary. Only 5-10% of patients with arterial hypertension suffer from secondary hypertension, whereas the vast majority has primary/essential hypertension.³

Raised blood pressure values have repeatedly been associated with the hazard of stroke and coronary heart disease; in addition, peripheral vascular disease, renal impairment, retinal hemorrhage and visual impairment are few of the complications of high blood pressure.⁴ The relative Risk Assessment Collaborating Group has recognized hypertension as the foremost risk factor of mortality and as the third most important risk

factor for disease load globally.⁵ According to a World Health Organization estimate; hypertension annually results in 7.5 million deaths globally.⁶ It has been recently estimated that 28.5% grownups in cost-effective countries and 31.5% adults in countries on the breadline had hypertension; moreover, from 2000 till 2010, the age-standardized occurrence of hypertension decreased by 2.6% in cost-effective countries however raised by 7.7% in under-privileged countries.⁷ This heterogeneity in the global prevalence of hypertension has been linked with lifestyle changes, racial and ethnic differences, and nutritional status and birth weight of an individual.⁸ In 2010, the East Asia or Pacific region of the world had the highest burden of hypertension globally.⁹ Locally in Pakistan, according to a 2014 World Health Organization estimate, the total occurrence of high blood pressure is 25.2%¹⁰, though a recent large scale cross-sectional study reported the age-standardized occurrence of hypertension in a Pakistani population to be 34.4%.¹¹ A systematic review in 2009 reported that frequency, responsiveness and management of hypertension in budding countries are impending to those in already developed countries.¹²

The presentation of hypertension varies clinically considerably among patients, depending upon several factors including their age and duration of their illness. Understanding the specific role of each factor may facilitate in subsequent management of such patients. The available recent literature regarding association of high blood pressure with dyspnea is limited at best¹³⁻¹⁵, and has not been examined in the context of potentially mediating role of age and hypertension duration. As a systematic research by the investigators did not disclose any relevant published confined data, this study was therefore carried out with the purpose of examining the effect of age and hypertension period on association linking hypertension with dyspnea.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Department of Anatomy and Medicine in the outpatient sector of a secondary care hospital after taking ethical approval from Shahida Islam Medical Complex, Lodhran January 2018 to July 2018. The inclusion criteria of the study were 18 years or above age, either gender, having self-reported hypertension history and

intake of anti-hypertensive medication. History of diabetes, cardiac events, neurological disorders, cluster headache, gastrointestinal disease, visual problems and epistaxis prior being recognized with hypertension and morbid obesity were the exclusion criteria of the study. After analyzing the capability and obtaining oral informed consent, patients were included in this study by using non-probability sampling method.

All the demographic information and hypertension related clinical signs and symptoms were recorded through interview by using a prearranged feedback form designed particularly for the study whereas the blood pressure levels were measured by a sphygmomanometer with stethoscope. The patients were divided into three groups based each on their age; up to 35 years old, 36 to 55 years old and 56 years old or above; and their duration of hypertension: up to 1 year, 2 to 9 years and 10 years or more, for the purpose of analysis. After data collection, SPSS version 20 was utilized for information cleaning, access and investigation. Chi-square test was used for inferential analysis whereas the significant level was kept at 0.05. The study duration was 6 months.

RESULTS

The whole information analyzed were of 304 cases out of which 157 (51.6%) were male, 166 (54.6%) were 36 to 55 years old whereas 193 (63.5%) had hypertension for 2 to 9 years. The study results showed that overall dyspnea was not notably related with either systolic or diastolic hypertension (table 1) The outcome of the study further displayed that among subjects aged up to 35 years dyspnea was importantly related with diastolic hypertension only ($p=0.016$) where patients with dyspnea were more likely to have stage 1/stage 2 diastolic hypertension than those who did not (65.2% vs. 30.8%) (table 2A); among patients aged 36 to 55 years dyspnea was not notably related with systolic or diastolic hypertension (table 2B) while among patients aged 56 years or above dyspnea was significantly associated with systolic hypertension only ($p=0.016$) where patients with dyspnea were more likely to have stage 1/stage 2 systolic hypertension than those who did not (82.0% vs. 59.0%) (Table 2C).

Table No1: Association between Dyspnea and Hypertension (Overall)

Variable (n=304)	Systolic Blood Pressure		P	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	46(28.5)	115(71.4)	0.089	74(46.0)	87(54.0)	0.211
No	54(37.8)	89(62.2)		76(53.1)	67(46.9)	

The study results further revealed that among patients with up to 1 year duration of hypertension dyspnea was not significantly related with either systolic or diastolic hypertension (table 3A); among cases with 2

Table No.2a: Association between Dyspnea and Hypertension (Up to 35 Years Old)

Variable (n=49)	Systolic Blood Pressure		p	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	9(39.1)	14(60.9)	0.445	8(34.8)	15(65.2)	0.016
No	13(50.0)	13(50.0)		18(69.2)	8(30.8)	

Table No.3 B: Association between Dyspnea and Hypertension (36 to 55 Years Old)

Variable (n=166)	Systolic Blood Pressure		p	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	28(31.8)	60(68.2)	0.974	42(47.7)	46(52.3)	0.899
No	25(32.1)	53(67.9)		38(48.7)	40(51.3)	

Table No.4 C: Association between Dyspnea and Hypertension (56 Years Old or Above)

Variable (n=89)	Systolic Blood Pressure		p	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	9(18.0)	41(82.0)	0.016	24(48.0)	26(52.0)	0.759
No	16(41.0)	23(59.0)		20(51.3)	19(48.7)	

Table No. 5 a: Association between Dyspnea and Hypertension (Up to 1 Year Hypertension Duration)

Variable (n=73)	Systolic Blood Pressure		p	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	11(28.2)	28(71.8)	0.157	17(43.6)	22(56.4)	0.425
No	15(44.1)	19(55.9)		18(52.9)	16(47.1)	

Table No 6 B: Association between Dyspnea and Hypertension (2 to 9 Years Hypertension Duration)

Variable (n=193)	Systolic Blood Pressure		p	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	32(31.7)	69(68.3)	0.766	51(50.5)	50(49.5)	0.816
No	31(33.7)	61(66.3)		48(52.2)	44(47.8)	

Table No. 7: C Association between Dyspnea and Hypertension (10 Years or More Hypertension Duration)

Variable (n=38)	Systolic Blood Pressure		p	Diastolic Blood Pressure		P
	Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive		Normotensive/Pre Hypertensive	Stage 1/Stage 2 Hypertensive	
	N (%)	N (%)		N (%)	N (%)	
Dyspnea						
Yes	3(14.3)	18(85.7)	0.037*	6(28.6)	15(71.4)	0.06
No	8(47.1)	9(52.9)		10(58.8)	7(41.2)	

*Fisher's Exact Test

The study results further revealed that among patients with up to 1 year duration of hypertension dyspnea was not significantly related with either systolic and diastolic hypertension (table 3A); among cases with 2 to 9 years duration of hypertension dyspnea was not notably related with systolic or diastolic hypertension (table 3B) while among patients with 10 years or more duration of hypertension dyspnea was significantly. Associated with systolic hypertension only ($p=0.037$) where patients with dyspnea were more likely to have stage 1/stage 2 systolic hypertension than those who did not (85.7% vs. 52.9%) (Table 3 C).

DISCUSSION

This study was conducted with the aim of examining the effect of age and hypertension period on association linking hypertension with dyspnea in a Pakistani population. The study results showed that overall dyspnea was not notably related with systolic or diastolic hypertension.

The outcome of the results further presented that among cases aged up to 35 years dyspnea was considerably linked with diastolic hypertension only; among cases of age 36 to 55 years dyspnea was not notably linked with either systolic or diastolic hypertension while among patients aged 56 years or above dyspnea was significantly associated with systolic hypertension only. Moreover, among patients with up to 1 year duration of hypertension dyspnea was not appreciably linked with either systolic or diastolic hypertension; among subjects with 2 to 9 years duration of hypertension dyspnea was not notably related with either systolic or diastolic hypertension while among patients with 10 years or more duration of hypertension dyspnea was significantly associated with systolic hypertension only. The relationship between hypertension and dyspnea has been reported previously, but the available literature is hardly thorough. Arras DJ et al., in 2005 proclaimed dyspnea to be significantly connected with elevated blood pressure.¹³ Karras DJ et al., in 2005 again found dyspnea to be associated with greater blood pressure values.¹⁴ Karras DJ et al., in 2006 also reported severely elevated blood pressure to be related with malady of dyspnea (OR 3.1; 95% CI 1.1 to 8.7).¹⁵

Moreover, with regard to effect of age and/or hypertension extent on such a correlation, no pertinent data could be extracted. It is nothing but expected that as a hypertensive patient grows older and the duration of illness increases, the clinical manifestations of the illness may increase, as a result of potentially poor blood pressure control. It has already been reported that blood pressure management whilst on anti-hypertensive Medications can differ considerably among hypertensive patients, from 5.4% to 58% in different regions of the world.¹⁶ Moreover, locally in Pakistan,

Blood pressure control among those taking anti-hypertensive therapy has been found to be 32.3%.¹¹ But the question remains as to whether variables like age and duration of illness affect manifestations of both systolic and diastolic hypertension in a similar way. Though a meaningful comparison of the study results could not be built because of lack of relevant available research, it was interesting to observe the mediating role each of the age and, to a lesser extent, the duration of hypertension plays in defining the relationship between hypertension and dyspnea.

CONCLUSION

Based on the study findings it can be concluded that both age and hypertension duration modify the relationship between hypertension and dyspnea, albeit to different extents. While deciding the management plan for hypertensive patients, the role of their age and hypertension duration should not be ignored, particularly in patients who present with dyspnea.

Author's Contribution:

Concept & Design of Study:	Sana Naz
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