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An Assessment of Difference in Manifestations of Mixed and Isolated Hypertension In Terms Of Their Signs and Symptoms in Hypertensive Patients

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Abstract

Background: It is not an uncommon practice to report the prevalence and effects of mixed hypertension and isolated hypertension on that of a patient's well-being separately. Though such outcomes have been reported to be dissimilar by a number of studies, literature do not shed any light on whether the two types of hypertension i.e. Mixed and isolated differ from each other in their manifestations.

Objective: To determine the difference in manifestations of mixed and isolated hypertension in terms of their signs and symptoms in hypertensive patients.

Methods: After taking ethical approval, a cross-sectional study was carried out among 152 conveniently sampled patients, aged 18 years or above, with self-reported history of hypertension who were taking anti-hypertensive medication. According to their blood pressure levels, patients were divided into two groups, those with mixed hypertension and those with isolated hypertension. A structured questionnaire was used to take a brief medical history whereas sphygmomanometer with stethoscope was used to measure the blood pressure of the patients.

Results: The study results revealed that among the signs and symptoms of hypertension only nausea was found to have a statistically significant association with type of hypertension (p=0.014). Furthermore, both history of headache and severity of chest pain were found to have only marginally insignificant associations with type of hypertension (p=0.063 and p=0.054 respectively). None of the other signs and symptoms of hypertension were associated with type of hypertension.

Conclusion: The study results revealed that only nausea had a statistically significant association with type of hypertension though both history of headache and severity of chest pain had only marginally insignificant associations with type of hypertension. Special focus on these symptoms by health care professionals during hypertension screening is recommended.

Keywords: Manifestations; Mixed Hypertension; Isolated Hypertension; Signs and Symptoms; Hypertensive Patients;

Introduction

In the year 2000, 26.4% of the world adult population has been reported to suffer from hypertension, two thirds of which belonged to developing countries.[1]A meta-analysis reported the prevalence of hypertension in Pakistan to be 17% based on data gathered prior to 2004.[2] More recently, World Health Organization reported that25.2% of the Pakistani population suffered from raised blood pressure in 2014.[3] Between 2000 and 2025, the prevalence of hypertension is projected to increase by 9% in men and 13% in women.[1]

A meta-analysis found that throughout middle and old age, blood pressure is strongly related to vascular mortality down to at least 115/75 mmHg.[4] Hypertension has been reported to result in 7.5 million deaths annually but despite being a serious health problem, is preventable and treatable.[5] Both lifestyle modifications such as smoking cessation, moderate alcohol consumption, reduced sodium intake and increased physical activity as well as blood lowering medications such as ACE inhibitors, Angiotensin receptor blockers, Thiazide diuretics and calcium channel blockers have been recommended for its management.[6]

As literature search revealed, it is not an uncommon practice to report the prevalence and effects of mixed hypertension and isolated hypertension on that of a patient's well-being separately, and though such outcomes have been reported to be dissimilar as well by a number of studies, literature do not shed any light on whether the two types of hypertension i.e. Mixed and isolated differ from each other in their manifestations.[7-9] In light of the evidence cited above, it is not unrealistic to suspect and therefore investigate the existence of such a difference.

This study, believed to be first of its kind, was thus carried out with the objective of determining the difference in manifestations of mixed and isolated hypertension in terms of their signs and symptoms in hypertensive patients.

Patients and Methods

A cross-sectional study was carried out among patients with self-reported history of hypertension who were taking anti-hypertensive medication. After taking ethical approval, a total of 152 conveniently sampled patients, aged 18 years or above, were included in the analysis who met inclusion criteria. Patients were divided into two groups according to their blood pressure levels, those with mixed hypertension and those with isolated hypertension. The guidelines of the seventh report of the Joint National Committee (JNC 7) were used to define mixed hypertension though patients with both stage I and stage II hypertension were considered to have mixed hypertension. [10] The criteria used by Franklin SS et al., in 2001 and Midha T et al., in 2012 was used to define isolated hypertension (systolic blood pressure ≥140 mmHg and diastolic blood pressure <90 mmHg or systolic blood pressure <140 mmHg and diastolic blood pressure ≥90 mmHg).[11, 12]

A structured questionnaire was used to take a brief medical history whereas sphygmomanometer with stethoscope was used to measure the blood pressure of the patients. History of cardiac events, neurological disorders, cluster headache, diabetes, gastrointestinal disease, visual problems, epistaxis and morbid obesity constituted the exclusion criteria.

The collected data were coded, entered and analyzed on SPSS version 20. Descriptive analysis was performed by calculating frequencies and percentages whereas inferential analysis was performed by applying chi-square test. The significance level was set at 0.05. The duration of study was six months.

Results

IThe study results revealed that 54.6% of the study participants were >40 years old, 53.3% of them were males whereas only 12.5% of them were smokers. 50.7% gave a positive history of headache and out of them 35.1% reported it to be severe. 36.8% gave a positive history of vertigo and out of them only 5.4% reported it to be severe. 24.3% had edema and in 64.9% of those it was present bilaterally whereas in 29.7% it was found to be of severe grade. 26.3% gave a positive history of chest pain and out of them 85.0% reported it to subside either with rest or by taking a medication. 40.8% gave a positive history of vision problems, 42.8% reported to suffer from dyspnea and out of them 36.9% reported it to be severe. 21.1% reported to suffer from nausea, 41.4% from sleep apnea, 34.9% from irregular heartbeat/palpitation, 60.5% from fatigue and 48.0% from confusion [Table 1].

The study results further revealed that among the signs and symptoms of hypertension tested for association with type of hypertension i.e. Mixed or isolated, only nausea was found to have a statistically significant association (p=0.014) where only those with mixed hypertension were likely to suffer from it (23.7% vs. Nil).Moreover, both history of headache and severity of chest pain were found to have only marginally insignificant associations with type of hypertension (p=0.063 and p=0.054 respectively) where those with a positive history of headache and chest pain that improves with rest or medication were more likely to have mixed type of hypertension (53.3% vs. 29.4% and 89.2% vs. 33.3% respectively). None of the other signs and symptoms of hypertension were found to be associated with type of hypertension [Table 2].

Discussion

The study results revealed that among the signs and symptoms of hypertension, only nausea was found to have a statistically significant association with type of hypertension. Moreover, both history of headache and severity of chest pain were found to have only marginally insignificant associations with type of hypertension.

Interestingly, the study findings revealed nausea to be significantly associated with mixed hypertension. A thorough search of the published literature did not reveal any evidence of such an association in patients on anti-hypertensive therapy. Though it is expected that all the study participants did not take similar anti-hypertensive therapy, but even without that consideration there is no prior evidence of persistence of nausea only in patients with mixed hypertension.

Table 1: Descriptive Analysis

Variables (n=152)		Frequency (%)
Age	≤40 Years	69(45.4)
	>40 Years	83(54.6)
Gender	Male	81(53.3)
	Female	71(46.7)
Smoking	Yes	19(12.5)
	No	133(87.5)
History of Headache	Yes	77(50.7)
	No	75(49.3)
Severity of Headache[1]	Mild/Moderate	50(64.9)
	Severe	27(35.1)
History of Vertigo	Yes	56(36.8)
	No	96(63.2)
Severity of Vertigo[2]	Mild/Moderate	53(94.6)
	Severe	3(5.4)
Edema	Yes	37(24.3)
	No	115(75.7)
Laterality of Edema[3]	Bilateral	24(64.9)
	Unilateral	13(35.1)
Grading of Bilateral Edema[3]	Mild/Moderate	26(70.3)
	Severe	11(29.7)
Chest Pain	Yes	40(26.3)
	No	112(73.7)
Severity of Chest Pain[4]	Improves with rest or medication	34(85.0)
	Requires hospital visit	6(15.0)
Vision Problems	Yes	62(40.8)
	No	90(59.2)
Dyspnea	Yes	65(42.8)
	No	87(57.2)
Dyspnea Severity[5]	Mild/Moderate	41(63.1)
	Severe	24(36.9)
Nausea	Yes	32(21.1)
	No	120(78.9)
Sleep Apnea	Yes	63(41.4)
	No	89(58.6)
Irregular Heartbeat/Palpitation	Yes	53(34.9)
	No	99(65.1)
Fatigue	Yes	92(60.5)
	No	60(39.5)
Confusion	Yes	73(48.0)
	No	79(52.0)

[1]n=77
[2]n=56
[3]n=37
[4]n=40
[5]n=65

Table 2: Relationship between Type and Signs and Symptoms of Hypertension

Variables Frequency (%)		Mixed Hypertension (n=135)	Isolated Hypertension (n=17)
		Frequency (%)	Frequency (%)
Smoking	Yes	15(11.1)	4(23.5)
	No	120(88.9)	13(76.5)
P		0.142*	
History of Headache	Yes	72(53.3)	5(29.4)
	No	63(46.7)	12(70.6)
P		0.063	
Severity of Headache[1]	Mild/Moderate	45(62.5)	5(100)
	Severe	27(37.5)	Nil
P		0.107*	
History of Vertigo	Yes	49(36.3)	7(41.2)
	No	86(63.7)	10(58.8)
P		0.694	
Severity of Vertigo[2]	Mild/Moderate	46(93.9)	7(100)
	Severe	3(6.1)	Nil
P		0.665*	
Edema	Yes	35(25.9)	2(11.8)
	No	100(74.1)	15(88.2)
P		0.163*	
Laterality of Edema[3]	Unilateral	22(62.9)	2(100)
	Bilateral	13(37.1)	Nil
P		0.414*	
Grading of Bilateral Edema[3]	Mild/Moderate	24(68.6)	2(100)
	Severe	11(31.4)	Nil
P		0.488*	
Chest Pain	Yes	37(27.4)	3(17.6)
	No	98(72.6)	14(82.4)
P		0.294*	
Severity of Chest Pain[4]	Improves with rest or medication	33(89.2)	1(33.3)
	Requires hospital visit	4(10.8)	2(66.7)
P		0.054*	
Vision Problems	Yes	58(43.0)	4(23.5)
	No	77(57.0)	13(76.5)
P		0.124	
Dyspnea	Yes	57(42.2)	8(47.1)
	No	78(57.8)	9(52.9)
P		0.704	

Severity of Dyspnea[5]	Mild/Moderate	35(61.4)	6(75.0)
	Severe	22(38.6)	2(25.0)
P		0.372*	
Nausea	Yes	32(23.7)	Nil
	No	103(76.3)	17(100)
P		0.014*	
Sleep Apnea	Yes	59(43.7)	4(23.5)
	No	76(56.3)	13(76.5)
P		0.112	
Irregular Heartbeat/ Palpitation	Yes	50(37.0)	3(17.6)
	No	85(63.0)	14(82.4)
P		0.114	
Fatigue	Yes	79(58.5)	13(76.5)
	No	56(41.5)	4(23.5)
P		0.154	
Confusion	Yes	63(46.7)	10(58.8)
	No	72(53.3)	7(41.2)
P		0.344	

*Fisher's Exact Test

[1]n=72 and 5 for mixed and isolated hypertension respectively

[2]n=49 and 7 for mixed and isolated hypertension respectively

[3]n=35 and 2 for mixed and isolated hypertension respectively

[4]n=36 and 3 for mixed and isolated hypertension respectively

[5]n=57 and 8 for mixed and isolated hypertension respectively

Furthermore, a positive history of headache as well as chest pain that improves with rest or medication rather than requiring a hospital visit was found to be marginally associated with mixed hypertension. As was the case with nausea, literature was not found to have reported similar associations earlier in patients on anti-hypertensive therapy.

As it has been shown that hypertensive patients who have uncontrolled blood pressure due to poor adherence to anti-hypertensive medication continue to be at risk of serious morbidity and mortality, and as adherence to anti-hypertensive therapy was not evaluated in the study participants, the presence of the above reported associations due to selective non-adherence only by patients with mixed hypertension cannot be ruled out, but as the group of participants with mixed hypertension was quite large as compared to those with isolated hypertension, such a conclusion appears highly improbable.[13]

Limitation and Recommendation

Having a moderate sample size and using convenient sampling technique because of financial and time constraints were the prime limitations of this study. In light of the study findings it is recommended that the symptoms identified in this study to be associated with type of hypertension, if present, need special attention of health care professionals during hypertension screening as they may be suggestive of the type of hypertension a patient has.

Conclusion

The study results revealed that only nausea was found to have a statistically significant association with type of hypertension though both history of headache and severity of chest pain were found to have only marginally insignificant associations with type of hypertension. None of the other signs and symptoms of hypertension were found to be associated with type of hypertension. Special focus on these symptoms by health care professionals during hypertension screening is recommended.

Conflicts of Interest

All authors have none to declare.

km2, 95% of which is equatorial forest. The official population is 229,000, but there are approximately 40,000 illegal immigrants.

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