

# CAUSES OF UNCONTROLLED BLOOD PRESSURE IN THE OVER-65 POPULATION

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## Abstract

**INTRODUCTION:** Hypertension is a major cause of cardiovascular disease and the prevalence of hypertension shows a linear increase with aging so that it increases by 10 percent every 10 years. This study was conducted to investigate the causes of uncontrolled blood pressure in people aged over 65 years.

**METHODS:** This descriptive case-control study was conducted at Isfahan Amin Hospital in 2003 on two-hundred over-65 subjects diagnosed with hypertension through a routine travel check-up for Mecca pilgrimage. After medical examinations and blood pressure measurement according to WHO standards, the subjects were divided into a case group (controlled blood pressure) and a control group (uncontrolled blood pressure), respectively. A questionnaire was filled in for each subject and the data were analyzed with  $\chi^2$  and t-student test.

**RESULTS:** The case and control groups had mean ages of  $70.7 \pm 5.2$  and  $69.5 \pm 4.9$  years, respectively. In the case group, less than half of the subjects were taking their antihypertensive medications regularly and 12.5% engaged in self-therapy. Fifty-five percent of subjects in the case group expressed a lack of motivation as the reason for discontinuing therapy. Their knowledge and practice were also found to be significantly lower than the control group ( $P < 0.05$ ).

**DISCUSSION:** In comparison with other studies, it was observed that the most common causes of uncontrolled blood pressure are poor knowledge, inappropriate practice in avoiding risk factors, and the discontinuation of pharmaceutical antihypertensive therapy.

**Keywords** • Hypertension • Cardiovascular diseases • Antihypertensive agents • Diet therapy

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## Introduction

Hypertension is an important CVD risk factor.<sup>1</sup> Although CVD-related deaths have decreased in most developed countries, they are still on the rise in some Baltic and Nordic states.<sup>2,3</sup> Cardiovascular diseases were the most important cause of death in Lithuania between 1970 and 1977. Hypertension was reported in 55.2% and 43.7% of men and women, respectively (hypertension: systolic blood pressure greater than or equal to 140 mmHg and/or diastolic blood pressure greater than or equal to 90 mmHg).<sup>4,5</sup>

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The importance of routine blood pressure measurements for early detection and prevention of hypertension (before development of symptoms) has been highlighted by some studies.<sup>6</sup> Long-term studies on hypertension have shown that hypertension can develop in early childhood and adult years. However, detection of hypertension is difficult in childhood years.<sup>7</sup> The prevalence of hypertension increases in a linear fashion with aging. After the age of 50, the prevalence of hypertension increases by 10% every ten years.<sup>8</sup> Based on some studies, although hypertension may occur at any age, the diagnosis of hypertension is made after the age of 60 in 90% of the cases. Many of these patients, however, should start receiving antihypertensive treatment at lower ages and in 70% of cases, blood pressure is not optimally controlled.<sup>9</sup>

A Chinese study found that 71% of hypertensive patients received appropriate medication at any given time period in a year and of these patients, only 20% had their blood pressure under optimal control.<sup>10</sup> Of all hypertensive patients, 80% received anti-hypertensive medication and 60% discontinued drug therapy.<sup>9,10</sup>

Studies have shown that diet can play a significant role in controlling blood pressure. Although previously salt was the only dietary component known to affect blood pressure, today other factors such as the type of consumed oil and the amount of vegetable intake are also known to be effective.

Blood pressure control is related to different factors, such as age, sex, obesity, and quality and continuity of drug therapy. Several studies have underlined the high prevalence of hypertension in obese individuals (as defined according to body mass index).<sup>12</sup> It has been seen in studies conducted on hypertensive individuals that physical activity reduces diastolic and systolic blood pressure by 1.5 mmHg and 4.5 mmHg, respectively.<sup>13</sup>

Uncontrolled blood pressure, its high prevalence, and direct relationship with coronary artery diseases highlight the importance of this risk factor in the CVD epidemic.<sup>14,15</sup> The risk of coronary artery disease rises by 30% for every 10 mmHg increase in systolic blood pressure.<sup>14</sup> This study was conducted with the aim of determining the causes of uncontrolled blood pressure and identifying preventive strategies.

### Materials and methods

This case-control study was performed on 200 over-65 patients with previously detected hypertension (diagnosed by the patients' physicians), who referred to Isfahan Amin Hospital for final check up. Each group consisted of 100 individuals who were selected for the study using simple sampling method. Diabetics, patients with kidney disease, and those on antidepressant medications were excluded from the study. The patients were divided into two groups, namely those with uncontrolled blood pressure (systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg on at least the last two visits despite drug therapy), and others with controlled blood pressure (systolic blood pressure  $< 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg on at least the last two visits). Blood pressure measurement was conducted according to WHO standards, i.e. average of two measurements 10 minutes apart, on the right arm after five minutes of resting in sitting position. All of the subjects were bound for Mecca; hence to elicit unbiased

information they were assured that the study was not in any way related to obtaining medical travel permit. Patients with uncontrolled hypertension were referred to their physicians for additional work-up.

A questionnaire obtaining data on demographic characteristics, date of detecting hypertension, type of treatment, level of knowledge and performance of patients about diet, exercise, cigarette smoking and stress management was filled out for both groups. Data were statistically analyzed with  $\chi^2$  test and t-test using SPSS10.

### Results

There was no significant difference between the case and control groups in respect of age, sex, education, and occupation (table 1).

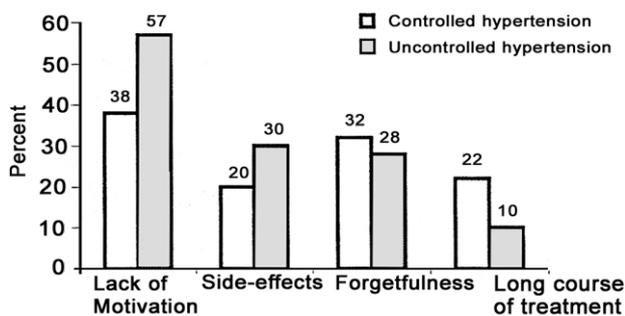
**TABLE 1.** Comparison of demographic characteristics between the case and control groups

	Case group	Control group
<i>Mean age (years)</i>	70.7 $\pm$ 5.2	69.5 $\pm$ 4.9
<i>Sex</i>	<i>Percentage</i>	<i>Percentage</i>
	Female	53.2
	Male	46.8
<i>Education (years)</i>	Illiterate	63.8
	1-6	27.7
	7-12	4.3
	<12	4.2
	<i>Occupation</i>	
Self-employed	14	21.2
Laborer	22	12.8
Clerical worker	2	0
Retired	62	66

In 60% of the subjects under study, hypertension had been detected within the last two years, i.e. around the age of 65.

No significant statistical difference was observed between the case and control groups. Sixty percent of the subjects in the case group and 9.8% of those in the control group stated that they were not on anti-hypertensive medication and of those receiving medication, 75% did not take their prescriptions regularly. Nearly 12.5% of the case group engaged in self-therapy.

Of 90.2% of control group subjects who were on anti-hypertensive medication, 98.5% continued treatment under a physician's supervision in regular visits, and 81.8% took their prescriptions regularly (table 2). The control group patients had higher knowledge and better performance.



**FIGURE 1.** Relative frequency of the causes of irregular treatment in the case and control groups

**TABLE 2.** Comparison of some of the causes of uncontrolled hypertension between the case and control groups

Variable	Case group	Control group	Significance	
Time of diagnosis (months ago)	1-2 mo	24	*NS	
	3-12 mo	34		
	13-24 mo	4		
	< 24 mo	38		
Mode of diagnosis	Accidental	34	NS	
	At home	2		
	Following other disease	59		
	Following a headache	5		
Drug therapy	YES	40	<0.05	
	NO	60		
Type of treatment if YES	a	Regular	25	<0.05
		Irregular	75	
	b	Supervised by physician	87.5	<0.05
		Self-therapy	12.5	
Number of times switching physicians	1	70	NS	
	2-3	16		
	>3	14		

\*NS: Non-significant

**TABLE 3.** Comparison of awareness and performance towards hypertension risk factors in the case and control groups

Parameters under study	Case group	Control group	Significance level
<b>Awareness</b>			
	%	%	
<i>Is nutrition effective?</i>			
YES	54	66	<0.05
NO	46	34	
<i>Is salt intake effective?</i>			
YES	14	91.5	<0.05
NO	86	8.5	
<i>Is exercise effective?</i>			
YES	46	83	<0.05
NO	54	17	
<i>Is smoking effective?</i>			
YES	24	74.5	<0.05
NO	76	25.5	
<i>Is stress effective?</i>			
YES	38	57.4	<0.05
NO	62	42.6	
<b>Performance</b>			
	%	%	
<i>Fat intake</i>			
On a diet	80.9	76	*NS
No diet	19.1	24	
<i>Vegetable/fruit intake</i>			
Plenty	10.6	58	<0.05
Little	89.4	42	
<i>Salt intake</i>			
Low-salt diet	8.5	86	<0.05
Salty/high-salt diet	91.5	14	
<i>Effort to lose weight</i>			
YES	31.9	30	NS
NO	68.1	70	
<i>Walking</i>			
3 times/week (1 hour)	19.1	30	NS
None	80.9	70	
<i>Cigarette smoking</i>			
Not smoking/has quit	12.8	96	<0.05
Smokes	87.2	4	
<i>Stress management</i>			
Good	46.8	52	NS
Not good	53.2	48	

\*NS: Non-significant

Their knowledge of the effect of nutrition (control: 66%, case: 54%), salt intake, cigarette smoking, exercise, and stress was significantly higher than the case group. There was a significant difference between the performance of the two groups in respect of fruit and vegetable intake, salt intake, and cigarette smoking (table 3).

Asked why they discontinued drug therapy, the case group patients referred to "lack of motivation" (57%) and drug side-effects (30%) as the most important reason. Patients in the group whose blood pressure had been controlled cited "lack of motivation" and "forgetfulness" as the main reasons for discontinuing drug therapy (figure 1).

### Discussion

Sixty percent of subjects in the case group and nearly 9.8% of those in the control group did not receive anti-hypertensive medication. Overall, more than one-third of patients with uncontrolled hypertension who were given antihypertensive drugs by a physician did not complete their course of treatment, or remained indifferent towards treatment. In a 1993 study conducted to determine the effect of pharmaceutical and non-pharmaceutical antihypertensive treatment found that 80% of hypertensive patients were on medication and that nearly 40% continued treatment.<sup>15</sup> In another study carried out in the United States, 71% of hypertensive subjects received antihypertensive medication; 63% of these took their prescriptions regularly and only 30% had their blood pressure under control. Sixty-one percent of subjects diagnosed with hypertension were under treatment with two or more antihypertensive drugs and 37% of these discontinued taking medications for some reason during the year.<sup>16</sup> In the present study, 81.8% of the group with controlled hypertension continued regular drug treatment, whereas 25% of the case group took their medications regularly. Forty-five percent of those who had discontinued treatment said they did not need drug therapy, 30% stated they had normal blood pressure, 25% blamed forgetfulness, 8% complained of side-effects, and 4% cited financial difficulties as the reason behind discontinuing treatment.

Eighty percent of patients covered by the Hypertension Control Clinic in 1999 were given drug treatment.<sup>17</sup> It is noteworthy that in more than 60% of these patients, hypertension had been first diagnosed after the age of 60, while many of them should have received drug therapy at lower ages. Hence in 70% of subjects who were diagnosed as hypertensive above the age of 60, blood pressure was not optimally controlled.<sup>18</sup>

Blood pressure screening at clinics has a prominent role in primary prevention of hypertension.<sup>6-8</sup> Studies have shown that hypertension is directly related to weight and height. Weight reduction has a statistically significant relationship with blood pressure and hypertension can be better controlled in individuals with lower weight. Weight reduction also reduces the dose of antihypertensive drugs required for optimal control.<sup>18-21</sup>

In this study, both the case and control group subjects acted similarly as regards weight reduction; this factor may be considered as insignificant given the natural fat degeneration in this age group ( $\geq 65$  years). Today, failure to follow the prescribed antihypertensive drug regimen is considered as the most important underlying cause of uncontrolled blood pressure, especially in individuals aged over 50 years; this fact underlines the necessity of corrective measures.<sup>11</sup> Another notable fact is the insufficient knowledge of the effect of outside factors (i.e. lifestyle) in blood pressure control.<sup>13</sup> It found in this study that the case group were in a poorer situation compared to the control group as regards observing a low-salt diet and healthy nutrition, stress management, smoking, and exercise. Other studies have demonstrated the effectiveness of diet in controlling hypertension.<sup>11</sup>

Results of this study and others carried out in different communities underpin the urgency of raising awareness towards the importance of drug treatment and healthy lifestyle in controlling hypertension. Patients following a suitable antihypertensive drug regimen with regular visits to their physicians and those with greater awareness of the effectiveness of non-pharmaceutical antihypertensive measures (i.e. healthy diet, exercise, stress management, non-smoking, weight reduction) tend to enjoy better hypertension control. This is a reminder of the key role of health professionals and the patients' families in efforts aimed at controlling one of the major risk factors of cardiovascular diseases.

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