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Research Article

Level of Knowledge and Control of Hypertension in a Population of the Argentine Patagonia

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Abstract

Objective: The information about Hypertension (HBP) has lately increased. Little is known in our country about the level of knowledge that the general population and hypertensive have about it. The aim was to evaluate if there were differences in Blood Pressure values (BP) in a group of patients in relation to the degree of knowledge they had about hypertension.

Methods: We admitted 170 patients, 86 women, average age: 45 ± 17 years, 19% of which are hypertensives, answered four questions regarding their knowledge of HBP. After that the BP was recorded to all patients. Statistical analysis was carried out using the Chi-square test, the analysis of variance and multiple correspondences.

Results: A percentage of 65% of the patients accurately answered the question pertaining normal values of BP, 10% did so with respect to what are the organs that are affected by HBP, 5% with respect to what foods should be avoided and 49% on whether the hypertension is cured. Women answered better than men with respect to normal blood pressure values ($p = 0.012$), affected organs ($p = 0.011$) and meals to avoid ($p = 0.044$). The Multiple Correspondence Analysis showed a general lack of knowledge associated with the age category, less than 40 years old, the male sex and not being under treatment.

Conclusion: People mostly knew what was the normal value of blood pressure but less about whether it is cured, which organs are affected and what foods should not be eaten. Being younger, being a man and not being under antihypertensive treatment were associated with poor knowledge of HBP.

Keywords: Arterial hypertension; Knowledge; Hypertension degree control

Introduction

High Blood Pressure (HBP) affects approximately 34% of the adult population of Argentina, [1] while the degree of control with antihypertensive treatment (<140-90 mmHg.) is only 5 to 27% according to the different series [2]. Some of the factors that may influence the normalization of Blood Pressure (BP) include adherence [3], the type and intensity of treatment [4], lifestyles [5], socioeconomic environment [6] and the patient's knowledge about HBP [7]. Previous studies have shown that more information about the pathology and the blood pressure lowering goals that hypertensive patients have helps to better control of BP [8]. Although recently both the public health authorities and the different scientific societies in our country have increased the warning about the adverse cardiovascular consequences of having HBP in the media, there are few studies that have analyzed the degree of knowledge that the general population and hypertensive in particular have about it.

The aim of our work was to evaluate the knowledge about hypertension in patients who attended a specialized center in hypertension in the city of Trelew, Chubut, Patagonia Argentina, and if the level of knowledge influenced the degree of blood pressure control.

Methods

170 patients, 86 (51%) women, mean age of 45 ± 17 years, who came to our Institution to be studied due to suspected HBP, were voluntarily invited to participate in the Study.

After signing the consent all patients responded to a written questionnaire consisting of the following four questions: 1) What is the value of normal blood pressure? 2) Is hypertension cured? 3) Mention at least three organs that are affected by hypertension;

4) Mention at least three foods that you should not eat if you have hypertension.

Once the questions were completed all patients had their blood pressure recorded twice separated by two minutes before entering the scheduled medical consultation using a calibrated mercury sphygmomanometer and according to the accepted methodology for the measurement of the BP in the office, (sitting position, arm at heart level, feet resting on the floor, back against the backrest and with a cuff adapted to the size of the arm). The average of the two measurements was considered as the true BP [9].

Phase I and V of Korotkoff sounds were used as an expression of systolic (SBP) and diastolic (DBP) respectively. HBP was considered at a SBP ≥ 140 mmHg. and / or DBP ≥ 90 mmHg. All the patients (100%) had some medical coverage of the different Social Security. The study protocol was approved by the Ethics Committee of our Institution.

Statistical analysis

A first descriptive analysis was carried out through frequencies and percentages for the categorical variables and measurements and position and dispersion summaries for the quantitative variables. In the univariate association between the responses and the measured characteristics to analyze the categorical characteristics, the Chi-square test and the analysis of variance were tested. (The latter for continuous characteristics). A Multivariate Correspondence Analysis was applied for the exploratory analysis of multidimensional categorical data that allowed us to interpret complex associations between the different levels of categorical variables. The age variable was analyzed as a continuous variable and categorized into different age groups. The answers "Number of organs answered correctly" and "Number of correctly foods responded" were treated as categorical, despite being of a continuous nature due to the few values that they took: 0, 1, 2 or 3 in both cases. The variable "hypertension" was defined as systolic blood pressure (SBP) equal to or greater than 140 and diastolic blood pressure (DBP) greater than or equal to 90. The statistical software SPSS v15.0 and the statistical package SAS v9.2 were used.

Results

Of the 170 patients studied, 86 (51%) were female and the average age was 45.2 years (15-86 years). 37% of the subjects (63) were considered hypertensive of whom 68% (43 patients) were under pharmacological treatment. The mean SBP of the total subjects was 131.3 ± 21.2 and the mean DBP was 82.0 ± 12.4 mmHg. (Table 1) 65% of patients answered correctly what was the normal BP value and 35% did it wrongly. (Table 2) With respect to the affected organs, only 10% did so with all three correctly, 34% with two organs and 21% with only one. 35% answered the three wrongly (Table 3). In relation to non-recommended foods, it was observed that only 5% correctly mentioned all three, 14% two foods and 45% only one. 36% did not mention any correctly. When analyzing the answers about whether hypertension has a cure, 51% answered incorrectly or did not know it (Table 4).

Sex	
Male	84 (49%)
Female	86 (51%)
Age Categories (years)	
Under 40	63 (37%)
40 – 60	72 (42%)
≥ 60	35 (21%)
Blood Pressure(mmHg)	
Mean SBP (all)	131.3
Mean DBP (all)	82
Male SBP	132.8
Female SBP	127.5
Male DBP	84.2
Female DBP	78.1
Hypertension	
Yes	63 (37%)
No	107 (63%)
Hypertensive under treatment	
Yes	43 (68%)
No	20 (32%)

Table 1: Characteristics of 170 patients.

Variable	**Normal BP Values**		**P Value**
	Yes (*N*=110)	No (N=60	
Sex			
Men	46 (55%)	38 (45%)	0.012
Women	64 (74%)	22 (26%)	
Age categories			
Under 40 years	29 (46%)	34 (54%)	.0004*
40-60 years	53 (74%)	19 (26%)	
Over 60 years	28 (80%)	7 (20%)	
Hypertension			
No	60 (59%)	42 (41%)	0.108
Yes	50 (79%)	13 (21%)	
Ant. treatment			
No	74 (58%)	53 (42%)	.005*
Yes	36 (84%)	7 (16%)	
Mean Age	49 (16)	38 (17)	< .001*
SBP	133 (21)	127 (21)	0.062
DBP	83	80	0.273
*Statistically significant			

Table 2: Associations between patient characteristics and answers about normal blood pressure values. N = 170.

Variable	Right answers on affected organs				P Values
	0 (N=60)	1 (N=35)	2 (N=58)	3 (N=17)	
Sex					
Men	36 (43%)	12 (14%)	32 (38%)	4 (5%)	.001*
Women	24 (28%)	23 (27%)	26 (30%)	13 (15%)	
Age categories					
Under 40 years	24 (38%)	11 (17%)	23 (37%)	5 (8%)	0.0112
40-60 years	21 (29%)	14 (19%)	25 (35%)	12 (17%)	
Over 60 years	15 (43%)	10 (29%)	10 (29%)	0 (0%)	
Hypertension					
No	36 (35%)	22 (22%)	37(36%)	10 (7%)	0.322
Yes	19 (30%)	13 (21%)	21 (33%)	10 (16%)	
Ant. treatment					
No	48 (38%)	27 (21%)	42 (33%)	10 (8%)	0.33
Yes	12 (28%)	8 (19%)	16 (37%)	7 (16%)	
Mean Age	46 (19)	49 (20)	43 (16)	43 (11)	0.312
SBP	134 (23)	129 (24	128 (17)	137 (22)	0.319
DBP	83 (12)	79 (12)	81 (11)	87 (16)	0.159
*Statistically significant					

Table 3: Associations between patient characteristics and answers on affected organs by hypertension. N = 170.

Variable	BP can be cured?		P values	Numbers of right foods				P Values
	Incorrect	Correct		0	1	2	3	
Men	48 (57%)	36 (43%)	.166	38 (45%)	30 (36%)	11 (13%)	3 (3%)	.044*
Women	39 (45%)	47 (55%)		23 (27%)	46 (53%)	12 (14%)	5 (6%)	
Age categories								
Under 40 years	33 (52%)	30 (48%)	.6108	28 (44%)	26 (41%)	6 (10%)	3 (5%)	.1747
40-60 years	34 (47%)	38 (53%)		17 (24%)	38 (53%)	13 (18%)	4 (6%)	
Over 60 years	20 (57%)	15 (43%)		16 (46%)	13 (37%)	5 (14%)	1 (3%)	
Hypertension								
No	54 (53%)	48 (47%)	.368	39 (38%)	46 (45%)	14 (14%)	3 (3%)	.357
Yes	28 (44%)	35 (56%)		18 (28%)	30 (48%)	10 (16%)	5 (8%)	
Ant. treatment								
No	70 (55%)	57 (45%)	.112	50 (39%)	55 (43%)	18 (14%)	4 (3%)	.193
Yes	17 (40%)	26 (60%)		11 (26%)	22 (51%)	6 (14%)	4 (9%)	
Mean Age	45 (18)	45 (17)	.865	44 (20)	46 (17)	46 (14)	42 (15)	.886
SBP	130 (20)	133 (22)	.42	131 (21)	130 (21)	134 (23)	139 (21)	.665
DBP	81 (12)	83 (13)	.551	82 (13)	81 (12)	85 (12)	87 (13)	.479
*Statistically significant								

Table 4: Associations between patient characteristics and answers about whether hypertension can be cured and foods to avoid if is suffered from hypertension. N = 170.

In relation to sex and with respect to the value of normal BP, women answered significantly better than men, because when analyzing the association between gender and the response of the normal BP value, it was observed that 64 (74%) women, knew the normal values, while among men, 46 of them (55%) answered correctly, which determined a significant association ($p = 0.012$). The answers obtained on the number of organs affected by hypertension, once again were significantly associated with gender, being women the ones that showed the greatest knowledge answering 15% of them correctly the three organs and 28% to none of them, whereas men showed a greater lack of knowledge since 43% did not answer any correct organ, and only 5% answered all three correctly ($p = 0.011$) (Table 2). Regarding whether HBP has a cure, although women answered better than men (55% vs. 43%) this difference did not reach statistical significance ($p = 0.166$). In relation to questions about the foods recommended not eating

in patients with HBP, it was observed once again that there were significant differences in relation to gender and the number of correctly answered foods, being the women the ones that showed the greatest knowledge, since 6% answered correctly the three foods vs. 3% of men. In turn, 27% of women did not correctly answer any food against 45% of men ($p = 0.044$) (Table 2).

When we analyze the association between the degree of knowledge and the normal values of BP, a significant association was observed with the age categories ($p <0.001$) and with being under treatment ($p = 0.005$), but there was no significant association with being hypertensive ($p = 0.196$), nor with the values of the SBP ($p = 0.062$), nor the DBP ($p = 0.273$).

With respect to age, it was observed that at higher age the knowledge about the normal value of BP increased. Thus, 46% of the individuals in the group under 40 responded correctly, 74% in the group of 40 to 60, and 80% in the group aged 60 or older ($p <0.001$).

At the same time, in the analysis of age as a continuous variable, in those who correctly answered the previous question, the mean age was 49 ± 16 years, while in those who did not answer the question correctly, the mean was 38 ± 17 years.

We also observed significant differences in relation to being under pharmacological treatment and the responses obtained, since 84% of the individuals who were in treatment responded correctly to what is normal BP, compared to 58% of those who were not in treatment ($p = 0.005$). In the Multivariate Analysis, it was observed that there is a widespread lack of knowledge in the whole group (wrong answers) and that it was strongly associated with the age category, under 40 years, with the male sex and not being under treatment. Finally, we found a positive association between being over 60 years old and being under antihypertensive treatment.

Discussion

In spite of the efforts made by the Scientific Societies and the Health Authorities of the different countries of the world, the control of the HBP is far from adequate [10]. Previous reports in the literature have shown that among the main causes of it, [11-13] the level of knowledge that patients have about HBP influences their control [7]. In one of these, Knigt E, et al, showed that not knowing the objective value of decreasing SBP with treatment was a risk factor for poor blood pressure control, having a significantly higher average BP, lower probability of taking medication, adopting a healthy style of life or attend the medical consultation in time [14]. On the other hand, the implementation of specific education programs has shown that a greater knowledge about HBP correlated positively with better control of both systolic and diastolic BP [15] and with a better adherence to treatment [16]. Interestingly, the level of comprehension and the concepts acquired about HBP also show significant ethnic differences. In a study carried out by Alexander et al in white, African-American, Latin and Asian subjects, asked about the possibility that HBP produces a stroke, individuals of the Asian and Latin races responded less correctly than the Caucasian and African-American subjects. In turn, African Americans were the worst that responded about kidney involvement in hypertension [17]. These and other findings have suggested that the application of an educational cultural program can improve the racial disparities observed in the control of BP [7].

Similar to that found in other studies where patients showed acceptable knowledge about the basic concepts of hypertension [17], in ours we found that most individuals knew what was the correct value of BP but much less about whether HBP can be cured, which organs are affected and which foods should be avoided. In reference to the BP values recorded in the patients and the level of knowledge, in contrast to that shown by other authors [17], our subjects presented an acceptable average of both the SBP and the DBP despite the lack of knowledge about HBP they expressed. However, accepting that poor information on hypertension is a risk factor for effective BP control, it could influence the future increased pressure values.

While other reports have shown a greater lack of knowledge about hypertension in women, [17] in ours, women answered significantly better than men to almost all the questions asked, which can be interpreted as a greater female interest in the subject probably through specific material readings, better information with the doctor or perhaps the positive capitalization of previous family experiences, taking into account that, at least in our experience, apart from her own consultations made, the vast majority of men who attend the doctor's office they do it accompanied by a woman either through a marital relationship, parents, brotherhood or friendship.

Age is another factor that has been shown to be related to the level of knowledge about HBP. Hayman D et al., in a paper on the characteristics presented by the subjects who did not control their HBP, they found that being over 65 years old was the strongest risk factor for the lack of information about it [18]. However, in our patients group, at higher age the knowledge about what are the normal BP values increased, being those over 60 who best answered while those under 40 whom more frequently failed in their answers. The differences found between both groups could be due to better information or interest on the subject in elderly patients, longer time under antihypertensive treatment or the greater presence of co morbidities, all of which have shown better control of hypertension and other pathologies [8].

As far as we know, our work has been one of the few if not the only one, which has evaluated staying under antihypertensive treatment and the level of knowledge that patients had about HBP. When analyzing the relationship between being under pharmacological treatment and the level of knowledge, we observed that hypertensive patients under treatment significantly responded better to questions than their peers without treatment. Being under treatment would mean better knowledge about BPH

in these patients in contrast to those who are not. The less knowledge of these patients without treatment could be explained by scarce information on hypertension and its consequences, for example having a recent diagnosis of the pathology, low intellectual level or total lack of adherence to treatment. In accordance with the above, patients older than 60 years, who demonstrated a better knowledge about BP values, also proved to be those who remained mostly in treatment.

Previous studies that tried to relate the level of knowledge that patients had about HBP with the BP values showed a positive association between them. Caballero E, et al. observed that the lack of knowledge about what the goal of decreasing SBP was an independent predictor of poor BP control [14]. In contrast, patients who participated in a special program on "Knowledge of hypertension" achieved an improvement in adherence and a significant reduction in both SBP and DBP values [15].

Unfortunately, this was not the case in our group of subjects, since in those who correctly answered the questions about what were the normal values of blood pressure, we could not show lower values in both systolic and diastolic BP in relation to those who answered wrongly. We do not have a clear explanation for this.

The multivariate analysis showed that the lack of knowledge is generalized and is associated progressively with younger age, being those under 40 years who showed the greatest lack of knowledge, something that was also observed in male and in hypertensive patients who were not under antihypertensive treatment. In other words, being younger, being a man and not taking medication was significantly associated with poor knowledge about HBP.

The knowledge that the patient has about HBP, seems to be of importance to achieve a better adherence to treatment and control of blood pressure. Those who have the possibility or interest to access updates on the subject, have better results in the control of the BP in relation to those who do not have them, as M Moser et al could demonstrate in a study on the management of hypertension in the long term [19].

According to the above, data obtained from subjects who recognize, for example, that HBP reduces life expectancy, have shown characteristics that condition better control of BP, such as higher levels of adherence, greater number of medical visits and taking of the medication [20]. In this aspect, the educational role that the doctor can fulfill seems to be a key point to improve the level of knowledge and awareness of patients and achieve the objectives of long-term blood pressure control [21].

It is recognized that the lack of appropriate medical coverage with difficulties in accessing good medical care, threatens adherence to treatment, BP control and probably a better knowledge of the pathology. However, recent evidence showed that the lack of control of hypertension could also be observed in the population with good access to different health systems [22]. In our group, despite the fact that all the participating subjects had some social coverage, this did not influence to demonstrate a better knowledge about hypertension.

Finally, the poor answers obtained in our patients, could be interpreted as a lack of interest to learn about the basic aspects of the pathology of its consequences [21] and what would be more worrying, of a scarce or absent information by the physician and / or of health system.

Limitations

The BP measurements, although they were recorded twice, were obtained in a single visit and in some cases in patients, who came to the visit for the first time, therefore, it is not possible to rule out transiently abnormal values due to the alert phenomenon and therefore, they have been erroneously classified as hypertensive.

In conclusion, the subjects who attended a specialized center in hypertension mostly knew what were the normal values of BP, but less about whether hypertension is cured, which organs are affected and which foods should be avoided. Women were better informed than men. The blood pressure values, both systolic and diastolic, were not related to the level of knowledge. Being younger, being a man and not being under treatment in hypertensive patients, was significantly associated with a poor knowledge about hypertension.

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