

Impact of Pets as Nonpharmacological Antihypertensive Maneuver in Hypertensive Patients

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Abstract

Background: Nearly half of the population has elevated blood pressure in industrialized world. Various lifestyle changes were described as non-pharmacological maneuvers in controlling hypertension. **Aim:** We planned this study to evaluate the impact of pets as a non-pharmacological antihypertensive maneuver in hypertensive patients. **Materials and Method:** A total of 5042 hypertensive patients were participated a validated and self applied questionnaire and inquiring current status about having a pet. **Results:** A total 562 patients consisting of dog owners, cat owners and farm animal owners were enrolled in this study. No-pet owners had mean systolic blood pressure (SBP)- 143.9 mmHg (141.3 mmHg–145.1 mmHg) and mean diastolic blood pressure (DBP)- 77.6 mmHg (76.5 mmHg–78.5 mmHg). Cat owners were 339 patients (6.05%) had mean SBP- 132.8 mmHg (130.5 mmHg–135.3 mmHg) and mean DBP- 74.7 mmHg (74.8 mmHg–75.3 mmHg). Dog owners were 158 patients (2.82%) had mean SBP- 139.5 mmHg (138.1 mmHg–141.2 mmHg) and mean DBP- 77.2 mmHg (76.3 mmHg–78.2 mmHg). And farm animal owners were 65 patients (1.1%) had mean SBP- 133.6 mmHg (135.4 mmHg–139.8 mmHg) and mean DBP- 73.2 mmHg (74.2 mmHg–76.2 mmHg). Male sex (odds ratio [OR], 1.17, 95% confidence interval [CI], 1.07–1.28, $P=0.002$), farm animal ownership (OR, 1.08, 95% CI, 1.06–1.11, $P=0.003$) and aging (OR, 1.23, 95% CI, 1.27–1.38, $P<0.001$) were significantly associated with higher blood pressures. Cat owners and farm animal owners used fewer medication (OR 1.9; 95% CI, 1.61–2.72, $P=0.003$) and (OR 2.09; 95% CI 1.61–2.72, $P=0.001$) respectively. **Conclusion:** Our study results showed pet ownership were associated with better blood pressure control and less medication. Owning a pet is lower in our country than developed world. This study results can be used to adopt stray animals in metropolitans but it must be kept in mind it is better to choose the appropriate animal to patients' natality.

Keywords: Hypertension, pet ownership, nonpharmacological maneuver

INTRODUCTION

Hypertension accounting for almost 10 million deaths and over 200 million disability-adjusted life years is the major cause of early death.^[1-3] Lowering blood pressure (BP) is associated with reduced premature morbidity and mortality. A number of proven, highly effective, well-tolerated lifestyle, and drug treatment strategies can achieve this reduction in BP. As population ages, people adopt a more sedentary lifestyle causing an increase in body weight and a rise in the prevalence of hypertension.^[4] Some nonmedical measures such as increased physical activity, keeping an ideal body weight, and eating a healthy diet are suggested in the first treatment step to reduce

morbidity and mortality.^[5-7] Stress is the major contributor to the cardiovascular diseases.^[8] Stress-reducing and physical activity increasing events like owning a pet may eventually lead to reduced cardiovascular events, but there is not a common consensus about disease and pets.^[9-12] In this study, we aim to evaluate the role of pets in controlling BP levels.

MATERIALS AND METHODS

After the Hospital Ethical Committee approval, a total of 5,042 hypertensive patients treated were included in this

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Received: 15-04-2020 Revised: 08-05-2020 Accepted: 22-05-2020

Published Online: 28-09-2020

Access this article online

Quick Response Code:



Website:
<http://www.ijcva.com>

DOI:
10.4103/IJCA.IJCA_9_20

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How to cite this article: Mansuroglu C. Impact of pets as nonpharmacological antihypertensive maneuver in hypertensive patients. *Int J Cardiovasc Acad* 2020;6:93-6.

Table 1: Baseline demographic characteristics of the patients with or without a pet

Variables	No pet ownership (n=4480; 88.85%)	Cat owners (n=339; 6.03%)	P	Dog owners (n=158; 2.81%)	P	Farm animal owners (n=65; 1.15%)	P
Age (years), mean	57.1±7.2	58.2±5.5	0.34	56.2±6.5	0.05	54.2±5.5	0.001
Female sex, n (%)	2072 (46.25%)	362 (64.41)	<0.001	102 (64.55)	<0.001	19 (29.23)	<0.001
BMI (kg/m ²), mean	25.07±4.4	24.9±4.8	0.45	22.7±3.7	0.001	20.6±7.2	<0.005
Diabetes mellitus, n (%)	123 (21.88)	31 (18.98)	0.005	12 (18.46)	0.001	1 (16.6)	<0.004
Coronary artery disease, n (%)	48 (14.23)	21 (13.39)	0.42	8 (12.23)	0.005	8 (12.75)	0.001
Cholesterol (mg/dL), mean	234.24±6.4	214.94±2.4	0.002	254.26±1.5	0.54	229.34±6.2	0.003
Cigarette smoking, n (%)	1752 (39.12)	145 (42.97)	0.43	65 (41.67)	0.56	28 (43.12)	0.43
Antihypertensive medication, n	3.4±5.6	2.5±3.2	0.001	2.1±3.7	0.001	1.2±4.3	<0.001

BMI: Body mass index

study. Volunteer patients participated to a validated and self-applied questionnaire. Participants' median age was 59 ± 9.8 years (34 ± 8.0–81 ± 3.0), and 2968 patients (58.88%) were men. Of 562/5042 patients (10.03%) owned a pet. Dog owners were 158 (2.82%), cat owners were 339 (6.05%), and farm animal owners were 65 (1.1%). The demographic characteristics including age, gender, history of arterial hypertension, diabetes mellitus, tobacco use, body mass index (BMI), and the number of medications are presented in Table 1.

BP measurements were measured in both upper arms, using an appropriate cuff size for the arm circumference twice by a specially trained nurse using a standard mercury sphygmomanometer, according to the European Society of Cardiology Guideline, 2019.^[11] Patients were defined as hypertensive if their mean systolic blood pressure (SBP) was ≥140 mm Hg, their mean diastolic blood pressure (DBP) was ≥90 mm Hg, or they reported current use of antihypertensive medication. Although relations between BP and cardiovascular risk exist from very low levels of BP as at SBP >115 mmHg definition of hypertension remains unchanged from previous ESH/ESC Guidelines. Our questionnaire included a group of standardized questions about patients and their demographic characteristics and were also included the questions asking their status of current exercise 3 or more times per week (no/yes), cigarette smoking history (never/past/current), current medication use (including the use of calcium channel blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers and one or multiple drug usage). And also, participants were analyzed about current pet ownership and the kind of pet. Debilitated patients and patients with a history of comorbid diseases such as malignancy, etc., were excluded from the study.

Statistical analysis

SPSS software (Version 18.0, SPSS Inc. Chicago, IL, USA) was used for statistical analysis. Variables were analyzed using the Kolmogorov–Smirnov test. Categorical variables were presented as percentages, and parametric variables were presented as mean ± standard deviation. Nonparametric variables were expressed as median (minimum-maximum). The normally distributed numeric variables were analyzed with

the Student's *t*-test, and nonnormally distributed variables were evaluated by the Mann–Whitney U-test variance analysis. The categorical variables compared with Chi-square test. *P* < 0.05 was accepted as statistically significant.

RESULTS

The variables in SBP and DBP were attenuated after adjustment for kind of pet, age, sex, BMI, antihypertensive medication use, exercise, and diabetes are shown in Table 2. Of a total 4480/5042 (88.88%) hypertensive patients who completed the questionnaire were no-pet owners had mean SBP-143.9 mmHg (141.3–145.1 mmHg) and mean DBP-77, 6 mmHg (76.5–78.5 mmHg). Cat owners were 339 patients (6.05%) had mean SBP-132.8 mmHg (130.5–135.3 mmHg) and mean DBP-74.7 mmHg (74.8–75.3 mmHg). Dog owners were 158 patients (2.82%) had mean SBP-139.5 mmHg (138.1–141.2 mmHg) and mean DBP-77.2 mmHg (76.3–78.2 mmHg). Moreover, farm animal owners were 65 patients (1.1%) had mean SBP-133.6 mmHg (135.4–139.8) and mean DBP-73.2 mmHg (74.2–76.2 mmHg). Male sex (odds ratio [OR], 1.17, 95% confidence interval [CI], 1.07–1.28, *P* = 0.002), farm animal ownership (OR, 1.08, 95% CI, 1.06–1.11, *P* = 0.003), and aging (OR, 1.23, 95% CI, 1.27–1.38, *P* < 0.001) were significantly associated with higher BPs. Cat owners and farm animal owners used fewer medication (OR 1.9; 95% CI 1.61–2.72, *P* = 0.003) and (OR 2.09; 95% CI 1.61–2.72, *P* = 0.001), respectively. Pet owners had significantly lower systolic and diastolic pressure values. In unadjusted analyses, pet owners had reduced hypertension levels (OR 0.72; 95% CI, 0.59–0.89, *P* = 0.001). Based on the unadjusted analyses current farm animal owners had mean SBP = 133.6 mmHg (135.4–139.8 mmHg), cat owners had mean SBP = 132.8 mmHg (130.5–135.3 mmHg), and no pet owners had mean SBP = 143.9 mmHg (141.3–145.1 mmHg). Our study results reveal that cat and farm animal owners use fewer medication from nonowners (OR 1.9; 95% CI, 1.61–2.72, *P* = 0.003) and (OR 2.09; 95% CI 1.61–2.72, *P* = 0.001), respectively. Farm animal owners had less coronary artery disease, diabetes, and not obesity. Characteristics associated with higher risk of elevated BP included male sex (OR 1.17, 95% CI, 1.07–1.28, *P* = 0.002) on no-pet ownership (OR, 1.08, 95% CI, 1.06–1.11, *P* = 0.003) and aging (OR, 1.23, 95%

Table 2: Multivariate-adjusted analysis mean systolic and diastolic arterial blood pressures and the odds ratios of blood pressures regarding the pet of the patients

Variable; n (%)	Blood pressure levels, mmHg	OR (95% CI)	P
No- pet ownership; 4480 (88.88)			
Mean systolic blood pressure (mmHg)	143.9 (141.3-145.1)	2.5 (0.9-4.2)	0.56
Diastolic blood pressure (mmHg)	77.6 (76.5-78.5)	1.5 (0.7-3.2)	0.43
Cat ownership; 339 (6.05)			
Mean systolic blood pressure (mmHg)	132.8 (130.5-135.3)	3.5 (1.7-6.2)	0.001
Diastolic blood pressure (mmHg)	74.7 (74.8-75.3)	2.5 (0.8-5.2)	0.001
Dog ownership; 158 (2.82)			
Mean systolic blood pressure (mmHg)	139.5 (138.1-141.2)	4.5 (3.7-8.2)	0.001
Diastolic blood pressure (mmHg)	77.2 (76.3-78.2)	2.5 (1.7-6.2)	<0.001
Farm animal ownership; 65 (1.16)			
Mean systolic blood pressure (mmHg)	133.6 (135.4-139.8)	4.5 (1.2-6.2)	<0.001
Diastolic blood pressure (mmHg)	73.2 (74.2-76.2)	2.5 (1.3-6.2)	<0.001

Adjusted comparisons for pet type, age, medications, diabetes, sex, BMI and exercise performed with multiple linear regression analysis. Significant at $P < 0.05$. BMI: Body mass index, CI: Confidence interval, OR: Odds ratio

CI, 1.27–1.38, $P < 0.00$). Female sex, cat, and farm animal ownership were related to lower BP levels. These results showed that pet ownership was independently associated with lower BP levels and less antihypertensive medication.

DISCUSSION

Although there are limited data available on the association about health benefit and pet ownership, a growing consensus supports the idea that pets might have favorable effects on human physical and psychological health. Stress has been related to the risk of too many diseases, especially hypertension, coronary artery disease, cancer, etc.^[13,14] Pets make the people more active, feel better and less stressed and its associated attributes.^[15] Therefore, it is reasonable to assume that any social factor, including pet ownership that reduces stress, will eventually reduce cardiovascular events. Although Friedmann *et al.*, and some small studies showed of 2–5 mmHg decrease in pet owners like salt reduction data regarding pet ownership and BP control is inconsistent.^[8,16] Cardiac arrhythmia suppression trial demonstrated that pet owners with heart disease had a higher survival rate and lower mortality rates in the follow up period in patients with pets.^[17,18] Cardiac arrhythmia suppression trial also demonstrated lower mortality rates in the follow-up period in patients with pets.^[19]

Because of these inconsistent results about having a pet and disease, we planned this study to evaluate the impact of pets in BP regulation. Our study showed that current pet ownership was associated with lower BP and less medication in unadjusted analyses. Similarly, unadjusted analyses suggested that cat and farm animal ownership conferred more benefits with regard to SBP. The results of this study are in contrast with those of a randomized study in 72 healthy, middle-aged Australian men and women, which showed that the presence of a dog had no effect on BP during a task inducing mental stress.^[20] In a report, one out of two people had a pet in developed countries.^[21] Our study results showed that only 10% of our patients had a

pet much lower than the developed world. Our study results showed generally better BP levels and make us to think to have a pet has a positive effect on BP regulation.

Study limitation

Our study has some limitations; first, the study is not a prospective, randomized controlled study. Second, long-term follow-up data are not available. Third, the information about the patients' attitudes toward the pets was absent. And also, in our study, BP recordings were done at one time at the office, continuous ambulatory, home recording BP values and other animals such as birds, etc., were absent. Finally, we did not have the patients' BP level before pet owning.

CONCLUSION

Although our study had some strong limitations because it is not a cohort study, had not have BP levels before pet ownership, our study results revealed pet ownership was associated with better BP levels and less medication. Conflicting study results may be related to inappropriate pet-owning by individuals' needs and natality. Our study results also showed that owning a pet in our country is not as common as in the world. These results can be used to guide teachers, veterinarians, and nongovernmental organizations to make people get interested in caring for and owning animals. Stray animals, which is one of the big problems of the metropolitans, can be solved by this way. However, first of all, our study results make us to think individuals must be warned about their needs and natality before adopting a pet.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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