Control of hypertension in Turkey – is it improving? The Kocaeli 2 study

Türkiye'de hipertansiyon kontrolü: Düzelme var mı? Kocaeli 2 çalışması

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Objectives: In a previous study conducted in Kocaeli, Turkey, ten years before, a very low rate of hypertension control (6.2%) was reported. This hypertension survey was conducted to determine whether the treatment and control rates of hypertension improved in the same region.

Study design: Using a stratified sampling method, 1222 subjects (559 males, 663 females, mean age 44.8±13.6 years) living in Kocaeli, aged 25 or over, were included. After administration of a standardized questionnaire, blood pressure was measured in the sitting position from both arms after at least five minutes of resting. The measurement was repeated after 10 minutes on the arm with the higher initial reading. Hypertension was defined as the presence of a mean systolic blood pressure ≥140 mmHg and/or a mean diastolic blood pressure ≥90 mmHg, or a previous diagnosis of hypertension and/or use of antihypertensive drugs.

Results: The prevalence of hypertension was 33.6% (37.1% in women, and 29.5% in men, p<0.001). Of the hypertensive subjects, 59.3% were aware of their condition. Hypertension was controlled in 8.7% of the subjects (systolic blood pressure <140 mmHg and diastolic blood pressure <90 mmHg).

Conclusion: Our results showed that about one-third of the adult population in Kocaeli had hypertension, with low rates of control and awareness. Since the previous survey, there has been a small improvement in hypertension control rate, but uncontrolled hypertension is still remarkably high in this geographical region. These findings are consistent with the recent Turkish Hypertension Prevalence study (PatenT) reporting a control rate of 8.1%.

Key words: Awareness; control; hypertension; Kocaeli; prevalence; treatment; Turkey.

Amaç: On yıl önce Kocaeli'nde yapılan bir çalışmada hipertansiyon kontrol oranının çok düşük (%6.2) olduğu bildirilmişti. Bu çalışma, aynı coğrafi bölgede, geçen zaman içinde hipertansiyon tedavi ve kontrol oranlarında bir düzelme olup olmadığını ortaya koymak için yapıldı.

Çalışma planı: Çalışmaya Kocaeli'nde yaşayan, 25 yaş veya üzeri 1222 olgu (559 erkek, 663 kadın, ort. yaş 44.8±13.6) kota örnekleme yöntemi kullanılarak alındı. Katılımcılara standart bir anket formu uygulandıktan sonra, en az beş dakikalık istirahat sonrası, oturur pozisyonda, her iki koldan kan basıncı ölçüldü. Kan basıncının yüksek olduğu kolda ölçüm 10 dakika sonra tekrarlandı. Ortalama sistolik kan basıncının ≥140 mmHg ve/veya ortalama diyastolik kan basıncının ≥90 mmHg olması veya daha önce hipertansiyon tanısı konmuş olması ve/veya antihipertansif ilaç kullanılmış olması hipertansiyon olarak kabul edildi.

Bulgular: Katılımcılarda hipertansiyon sıklığı %33.6 bulundu (kadınlarda %37.1, erkeklerde %29.5, p<0.001). Hipertansif olanların %59.3'ü bu durumun farkında idi. Olguların %8.7'sinde hipertansiyon kontrol altındaydı (sistolik kan basıncı <140 mmHg ve diyastolik kan basıncı <90 mmHg).

Sonuç: Kocaeli'nde erişkin nüfusun yaklaşık üçte biri hipertansiftir ve kontrol ve farkındalık oranları düşüktür. Hipertansiyon kontrol oranlarında önceki verilere göre küçük bir düzelme olmasına rağmen, kontrolsüz hipertansiyon ülkemizin bu bölgesinde hala çok yüksektir. Bu sonuçlar hipertansiyon kontrol oranının %8.1 olarak bildirildiği Türk Hipertansiyon Prevalans Çalışması (PatenT) ile uyumludur.

Anahtar sözcükler: Farkındalık; kontrol; hipertansiyon; Kocaeli; prevalans; tedavi; Türkiye.

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In many countries, significant numbers of individuals with hypertension are unaware of their condition; and among those diagnosed with hypertension, treatment is frequently inadequate.[1] The Turkish Hypertension Prevalence Study (PatenT) found that one-third of the adult population (>18 years) in Turkey had high blood pressure, with low rates of awareness, treatment, and control.[2] The present study was conducted to determine changes, during a 10-year period, in prevalence, awareness, and control rates in adults in Derince district of Kocaeli, Turkey, based on a comparison of findings with those reported by our group in a previous study[3] conducted in the same area.

PARTICIPANTS AND METHODS

Individuals aged 25 or over living in Derince district of Kocaeli were included. Informed consent was obtained from each subject before the study procedures were commenced, and the study protocol was approved by the local ethics committee. The study was conducted in accordance with the principles of the Helsinki Declaration.

Study design. A cross-sectional study was designed, and data were collected by the use of a questionnaire and measurements. The questionnaire included 35 closed-ended questions to derive information on demographic characteristics (age, gender, education, occupation, social insurance, number of pregnancies and births), conditions affecting blood pressure (alcohol and cigarette use, consumption of meat, level of physical activity), and awareness and attitudes toward high blood pressure (family history of high blood pressure, availability of a blood pressure measuring device at home, the date of last blood pressure measurement etc.).

Study participants and conditions. Approximately 100,000 residents live in Derince. Of these, nearly 36,000 were estimated to be aged 25 years or over. A preliminary inquiry was conducted to determine the areas for optimal study conditions. The study participants were selected on the basis of a quota sampling method. A percentage of at least 45% was targeted for each sex during home and workplace visits by the study team. The questionnaire was administered by the investigators during face-to-face interviews with the participants. If the request for interview was refused, a substitution was made with a predetermined person. A total of 1,347 questionnaires were completed and, of these, 125 were excluded due to insufficient or unreliable responses, yielding 1,222 questionnaires to be included in the study.

Anthropometric measurements. Blood pressure measurements were carried out by the same investigator according to the standard methods recommended by the British Hypertension Society, using a suitably calibrated aneroid sphygmomanometer.[4] Consumption of tea, coffee, or cigarette was avoided for at least 30 minutes prior to blood pressure measurements. The initial measurement was performed after five minutes of rest, on both arms, with both arms bare and with the upper arm being at the level of the heart and elbows assisted. After 10 minutes, the second measurement was made from the arm with the higher initial reading and this final value was used for the study. A third reading was taken if a difference greater than 20/10 mmHg (for systolic and diastolic readings, respectively) was noted. The arithmetic mean of the second and third measurements was calculated as the final blood pressure measurement. Korotkoff phase 1 (beginning of sound) and Korotkoff phase 5 (disappearance of sound) were taken as the systolic and diastolic identification points, respectively, with the measurements being recorded to the nearest 2 mmHg. Weight and height were measured with a calibrated scale and a measuring tape, respectively, without shoes and heavy clothes.

Hypertension was defined as the presence of a mean systolic blood pressure ≥140 mmHg and/or a mean diastolic blood pressure ≥90 mmHg, or a previous diagnosis of hypertension and/or use of antihypertensive drugs. High blood pressure was classified according to the JNC-VII guidelines.[5] Awareness was defined as any prior diagnosis of hypertension by a health care professional. Treatment status was defined as self-reporting of antihypertensive use during the interview. Controlled hypertension was defined as systolic and diastolic blood pressure measurements of less than 140 mmHg and 90 mmHg, respectively, during the interview.

Statistical analyses. The data analysis was performed using SPSS 13.0 software. Percentages were compared using the chi-square test, and numerical variables with normal distribution were compared using the t-test. A p value less than 0.05 was considered significant.

RESULTS

Of 1,222 participants (mean age 44.8±13.6 years), 663 were females (mean age 42.6±12.76 years) and 559 were males (mean age 47.3±14.1 years).

Table 1 shows the distribution of blood pressure levels according to the JNC-VII classification. The prevalence of high blood pressure in the overall study

Table 1. Distribution of the subjects by the JNC-VII classification

Category	Blood pressure	Overall (n, %)	Male (n, %)	Female (n, %)
Normal	SBP <120 mmHg DBP <80 mmHg	495 (40.5)	238 (42.6)	257 (38.8)
Prehypertension	SBP 120-139 mmHg DBP 80-89 mmHg	316 (25.9)	156 (27.9)	160 (24.1)
Stage 1 hypertension	SBP 140-159 mmHg DBP 90-99 mmHg	268 (21.9)	100 (17.9)	168 (25.3)
Stage 2 hypertension	SBP ≥160 mmHg DBP ≥100 mmHg	143 (11.7)	65 (11.6)	78 (11.8)
Prevalence of hypertension	SBP ≥140 mmHg and/or DBP ≥90 mmHg	411 (33.6)	165 (29.5)	246 (37.1)

SBP: Systolic blood pressure, DBP: Diastolic blood pressure.

population was 33.6%, with a higher prevalence in female subjects (37.1% *vs*. 29.5%, p<0.001). Figure 1 displays the prevalence, awareness, treatment, and control rates in comparison with the results of a previous report in the same region by Gündoğmuş et al.[3]

Our results showed that no significant changes occurred in hypertension prevalence during the 10-year period between 1999 and 2009 (33.7% *vs*. 33.6%), while the most remarkable increase (10.3%) was observed in the rate of awareness. Although no increase was observed in the percentage of subjects receiving antihypertensive medications, the control rate improved from 6.2% to 8.7% (a relative increase of 40.3%).

DISCUSSION

The results of the present study suggest that there has been no significant change in the prevalence of hypertension in Turkey, along with an insufficient improvement in the control and awareness rates.

Hypertension is regarded as a preventable public health problem. Improvement in control rates depends on increased awareness, early recognition, implementation of effective therapeutic strategies, and long-term monitoring of prevalence, awareness, treatment, and control rates to develop preventive strategies.[6] Despite increased prevalence of hypertension in many countries, treatment and control rates appear to improve as a result of effective public health strategies and changes in antihypertensive treatment.[7,8] For instance, a significant increase in the prevalence of hypertension was observed in the adult population over the age of 18 years in the US from 24.4% in 1988-1994 to 28.9% in 1999-2004. However, this was accompanied by a significant increase in awareness, treatment, and control rates as well (from 68.5% to 71.8%, from 53.1% to 61.4%, and from 26.1% to 35.1%, respectively).[9] Similarly, in the UK, despite an increased prevalence of hypertension from 2003 to 2006 in subjects aged 16 years or older, awareness, treatment, and control rates also increased (from 62% to 66%, 48% to 54%, and 22% to 28%, respectively).[10] Conversely, relatively lower rates of awareness, treatment, and control have been reported in Turkish population, with high prevalence rates.[2,3,11-13]

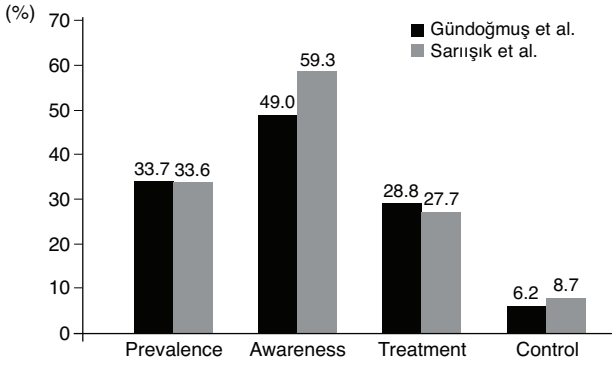

Figure 1. The changes in the prevalence, awareness, treatment, and control rates of hypertension.

The objective of our study was to determine the prevalence, awareness, treatment, and control rates in a population (aged 25 or older) from Derince district of Kocaeli county, the residents of which were expected to be more or less representative of the general Turkish population due to high immigration numbers from other geographical locations of Turkey, resulting in a remarkable economical, cultural and social diversity.

Furthermore, our results were compared with a previous report from the same region[3] to determine the changes in these trends. One of the investigators (AO) participated in both studies and was responsible for the design and planning of the present study. In addition, houses and workplaces visited in the previ-

ous study were excluded from the sample in order to avoid biased conclusions in terms of awareness, treatment, and control rates. The 10-year period was not associated with a significant change in the prevalence of hypertension, while a 1.1% decrease in treatment rate was observed together with improved rates of awareness and control (10.3 and 2.5%, respectively). Though an absolute improvement of 2.5% may seem to be quite insufficient, the relative improvement of 40.3% (34.5% in the US and 27.3% in the UK) is promising.[9,10] The improvement in control rates in the absence of increased treatment may be associated with increased awareness about this condition along with the use of more effective antihypertensives.[14] We believe that awareness campaigns organized by governmental and non-governmental organizations during that 10-year period have a significant share in this improvement.

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İlgi çakışması bildirimi

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Conflict of interest statement

The author has provided professional consulting for Boehringer Ingelheim Inc. in some projects.