Abstract

Background: Hypertension is an important public health problem and one of the leading risk factors for morbidity and mortality from cardiovascular diseases.

Aims: This study aimed to find out the prevalence of hypertension in a population sample of older adults in Erbil city, Iraqi Kurdistan Region, and identify the risk factors associated with hypertension.

Methods: A community-based cross-sectional survey based on household visits was carried out from April to June 2017. The study involved 1480 adults selected through a multi-stage sampling method. We used a specially designed questionnaire to collect sociodemographic and clinical data from the participants through direct interview with measurement of the blood pressure.

Results: Of the 1480 study participants, 809 (54.7%) participants were identified as having hypertension. Of these 809 hypertensive patients, 375 (46.4%) were known cases of hypertension and 434 (53.6%) were diagnosed during the survey. The multivariate analysis identified age (OR = 1.1, 95% CI = 1.08–1.11), male (OR = 2.72, 95% CI = 1.91–3.87), non-employment (OR = 1.85, 95% CI = 1.33–2.56), and obesity (OR = 2.20, 95% CI = 1.51–3.21) as the statistically significant factors associated with hypertension.

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Conclusion: The prevalence of hypertension in Erbil city is relatively high with having a high prevalence of undiagnosed hypertension. Compliance with the treatment was relatively high, but access to drugs was primarily from private pharmacies. This high prevalence of hypertension in Erbil city necessitates effective preventive and control measures, including carrying out comprehensive health education and screening programmes.

Keywords: Hypertension; Prevalence; Household survey; Risk factors


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Background

Hypertension is the most common cause of primary care visits, and it is an independent and a reversible risk factor for cardiovascular diseases such as myocardial infarction, stroke and renal failure. It can even lead to death if not diagnosed early and treated appropriately (1). Worldwide, hypertension is considered to be a major public health problem (2). It is believed to be the leading cause of death and the most frequent cause of outpatient visits (3). Regarding its contribution to the growing global pandemic of cardiovascular disease, recently confirmed by the update of the Global Burden of Disease Study (2000), hypertension is estimated to be responsible for around 50% of cardiovascular diseases (CVD) worldwide (4). It is also considered to be one of the main risk factors for mortality from CVD, accounting for 20–50% of all deaths (5).

Hypertension among the adult population is increasing, and its complications account for 9.4 million annual deaths worldwide. Unlike high-income countries, low-income countries have the
highest prevalence of hypertension. The prevalence of hypertension is highest in the African Region at 46% of adults aged 25 and above, and this proportion is increasing (6). About three-quarters of people with hypertension are from low- and middle-income countries, as the access to healthcare, as well as the awareness of the disease, are inadequate. In general, The Middle Eastern countries have a high prevalence of hypertension. A study conducted in the Islamic Republic of Iran revealed that more than 57% of the people aging 60 years and above have hypertension, compared to 3.6% of those people younger than 30 years (7). Moreover, it was reported that the number of deaths resulting from hypertensive cardiac diseases in the Middle East and North Africa region was 115 per 100 000 and that the number of disability-adjusted life years resulting from hypertensive cardiac diseases was 1389 per 100 000 in the same region (8).

In 2006, a survey conducted in Iraq on chronic noncommunicable disease risk factors revealed that the prevalence of hypertension was 40.4% (9). The WHO Eastern Mediterranean Region health statistics published in 2008 revealed that the prevalence of hypertension in Iraq for both sexes was 29.4% (20.4–38.9%) (10). A household survey conducted in Thi-Qar Governorate in 2014, revealed that the overall prevalence of hypertension was 26.5% (11).

In low- and middle-income countries, many people with hypertension are not aware of their disease and may not be aware of the necessity for regular blood pressure checks. They may also not have access to drugs which control their hypertension and reduce mortality and morbidity from complications such as heart disease and stroke. People may simply be unaware of the health consequences or indifferent to the risks of untreated hypertension (12). Therefore, this study aimed to find out the prevalence of hypertension in a population sample of older adults in Erbil city, Iraqi Kurdistan Region, and identify the risk factors associated with hypertension.

**Methods**

The study was conducted in Erbil city, the capital of Iraqi Kurdistan, from April to June 2017. A community-based cross-sectional survey based on household visits was carried out for this purpose. A multi-stage sampling method was used to collect the study subjects. In the first stage, Erbil city was divided into 20 quarters based on the administrative map of the city, and a systematic random sampling method was used to select 30 households in each quarter. For each quarter, we determined a sampling interval k as the ratio of the estimated quarter size to the sample size of 30. The first household in each quarter was selected randomly, and the next households were selected by selecting every kth household.

The study population included all the adult inhabitants of these households aged 18 years or
over. Data collection was done through direct interview using a special questionnaire designed for this purpose. The questionnaire included personal and sociodemographic information such as age, sex, marital status, educational level, employment status and type of occupation. It also included questions on smoking, alcohol consumption, diet, salt intake and performing physical exercise. Systolic and diastolic blood pressure was measured for each subject on two occasions; the first reading after at least 5 minutes’ rest, and the second one 5 minutes after the first reading. Subjects' weight and height were also measured, and the body mass index was calculated. The surveyors were trained in administering the questionnaire and blood pressure measurement. A pilot study was conducted to test the validity and applicability of the questionnaire and based on that modifications were made accordingly. The pilot study revealed that the internal consistency (Cronbach's alpha) estimation of the questionnaire was 0.79 and the reliability coefficient was 0.82.

Using the Epi-info, the sample size was calculated assuming that the prevalence of hypertension in Erbil city is similar to the previously reported 40% for Iraqi adults (13). We found that a sample size of 1473 was sufficient to achieve a 95% confidence interval for the prevalence (±2.5%) in this population. The sample was increased to 1500 to accommodate for non-response. We assumed that each household would have two to three adults above 18 years old and visiting 600 households will produce a sample of around 1500 participants. Therefore, we selected 30 households in each of the 20 quarters.

Ethical approval was obtained from the Research Ethics Committee at the authors' institution. Approval was also obtained from Erbil Governor and Erbil Mayor offices for this purpose. Informed consents were obtained from the participants who were assured about the anonymity of the study. The participants were informed about their blood pressure status, and those with elevated blood pressure, especially the newly diagnosed hypertensive patients, were advised about seeking appropriate health care for that.

The statistical package for the social sciences (version 19) was used for data entry and analysis. The second blood pressure measurement was used to determine elevated blood pressure in the study participants. We used the 2017 American College of Cardiology/American Heart Association new guidelines for the prevention, detection, evaluation, and management of high blood pressure in adults that set a cutpoint of 130/80 mm Hg for hypertension (14). A person with a systolic blood pressure of ≥130 mm Hg and/or a diastolic blood pressure of ≥80 mm Hg during the second reading was considered hypertensive. Student’s t-test was used to compare two independent sample means. The Chi-square test was used for comparing proportions. A P value < 0.05 was considered as statistically significant. The multivariate analysis was based on binary logistic regression to adjust for and examine the independent effects of possible covariates. Odds ratios (ORs) with their 95% confidence intervals (CI) were calculated. ORs were estimated to measure the strength of the associations while 95%
confident intervals and the P values were estimated for significance testing.

Results

The survey identified 1480 adult participants in the 600 visited households. The mean ± SD age of the participants was 46.4 ± 16.3 years with no statistically significant difference between the mean age of males (46.7 ± 16.6) and females (46.2 ± 16.2), P = 0.612. A total of 375 (25.3%) participants were in the age group 60 years or above, while 336 (22.7%) were in the 30–39 years age group and 307 (20.7%) were in the 40–49 years age group. A total of 1117 (75.5%) participants were female, 926 (62.6%) were housewives, 667 (45.1%) were illiterate, 1334 (90.1%) were married and 1391 (94%) were of medium economic status. A total of 340 (23%) participants were employed with 298 (20.1%) being in the government office-based jobs as shown in Table 1.

Of 1480 study participants, 375 (25.3%) were already diagnosed as having hypertension. Of these 375 participants with known hypertension, 330 (88%) were taking their antihypertensive treatment regularly, 22 (5.9%) were taking the treatment irregularly, while 23 (6.1%) were not taking their treatment. Of these 375 hypertensive patients, 292 (77.9%) were having their antihypertensive treatment from private pharmacies and only 47 (12.5%) were having it from the public hospitals without charge. Of the 1480 study participants, 809 (54.9%) participants had hypertension. These included both the previously diagnosed hypertensive patients and newly diagnosed based on blood pressure readings. Of these 809 hypertensive patients, 249 (30.8%) were known cases of hypertension with uncontrolled blood pressure, 126 (15.6%) were known cases of hypertension with controlled blood pressure and 434 (53.6%) did not know that they are hypertensive but had a high blood pressure reading on examination. Of the 434 newly diagnosed hypertension cases, 142 (32.5%) had isolated systolic hypertension, 38 (8.5%) had isolated diastolic hypertension, and the remaining 256 (59%) had combined systolic and diastolic hypertension. Details of the clinical characteristics of the study participants are shown in Table 2.

The hypertensive participants had a statistically significant higher mean age (54.3 ± 15.1) than non-hypertensive participants (36.8 ± 11.8), P < 0.001. There was a statistically significant association between hypertension and increasing age, being male, being married, low educational level, non-employment, poor economic situation, sedentary lifestyle, lack of regular physical exercise and increasing body mass index. A nonsignificant association was found with smoking, alcohol consumption, table salt intake and positive family history of hypertension as shown in Table 3.

The multivariate analysis identified age (OR = 1.1, 95% CI = 1.08-1.11), male (OR = 2.72, 95%
CI = 1.91–3.87), non-employment (OR = 1.85, 95% CI = 1.33–2.56), and obesity (OR = 2.20, 95% CI = 1.51–3.21) as statistically significant factors associated with hypertension (Table 4).

Discussion

Our study revealed that the prevalence of hypertension among Erbil city populations was 54.7%. This prevalence is much higher than what was reported from a study conducted in Nasiriyah city, Iraq in 2014 (26.5%) (11) and still higher than what was reported across Iraq in 2006 (40.4%) (15) and by WHO in 2013 (40%) (13). Studies conducted in neighbouring countries had also shown a high prevalence of hypertension ranging from 32.3% in Jordan to 44% in Turkey (16–18). However, a lower prevalence of 26.1% was reported in Saudi Arabia (19). The very high prevalence in our study is partially attributed to using the 130/80 mm Hg cutpoint according to the new guideline (14) while the other studies have used the 140/90 mm Hg cutpoint. However, even the prevalence of stage 2 hypertension, which is based on 140/90 mm Hg cutpoint, was still considerably high (40.1%) in our study.

The prevalence of hypertension is always under-estimated, especially in low- and middle-income countries (20), and the detection of high blood pressure level is made through routine examination or after the development of complications (21). Our study showed that 53.6% of the cases of high blood pressure were previously undetected which makes 29.3% of the studied population. This percentage is much higher compared to the 7.4% reported in the Nasiriyah study (11).

This study showed a statistically significant association between the prevalence of hypertension and gender (63.4% for males and 51.8% for females). However, other studies from Nasiriyah (11), Turkey (18) and the Islamic Republic of Iran (22) showed a higher prevalence of hypertension among females compared to males. In general, some risk factors for developing hypertension such as increased body weight and sedentary lifestyle might be more common in females.

The statistically significant association between hypertension and increasing age might be attributed to the increased arterial stiffness with increasing age. An epidemiological study conducted in 2004 showed that the prevalence of hypertension is more than twice in old aged population compared to the younger population (23). Our results in this regard are also consistent with those of other studies from Nasiriyah city, Iraq (11) and Central India (24). According to the Seventh Report of the Joint National Committee in 2003, more than two-thirds of the population older than 65 years, experience hypertension (25).
A statistically significant association was also found between hypertension and marital status with a prevalence of 57.3% among ever-married people compared to only 29.6% among the unmarried population. Married people are usually older than unmarried, and this might be the reason for such difference in the prevalence of hypertension among these two groups. These results are also consistent with the Nasiriyah city study (11) and the Central India study (24). However, research has shown that married women have a lower risk of developing hypertension where marital happiness or satisfaction might play a role in attaining better health. However, experiencing marital status change is likely to lead to some adverse effects, including hypertension (26).

The prevalence of hypertension was inversely related to the education level in the present study. A significant association was found between hypertension and low educational level; 69% among the illiterate population, compared to 45.1% and 31.8% among primary and secondary levels of education respectively. These results were consistent with some other studies from Iraq and outside Iraq (11,27). Such association could be primarily attributed to the low level of awareness among the poorly educated people regarding following a healthy lifestyle.

The prevalence of hypertension was significantly higher in the unemployed and those with lower socioeconomic status. A metanalysis showed an increased risk of hypertension among the people with the lowest socioeconomic status, particularly for the three indicators of income, occupation and education. The risk was particularly most evident for women (28).

The study revealed a significant association between hypertension and increasing body mass index with a prevalence of 64.8% among obese people compared to 51.3% and 37.1% among overweight and normal weight respectively. Our results were consistent with a study conducted in Central India (24). This association supports the fact that increased body weight is a primary risk factor for hypertension. The dietary patterns in Iraqi Kurdistan Region might play a role in the problem of obesity and hypertension. The Iraqi diet is enormously rich and varied as it reflects a rich inheritance as well as complex influences from the culinary traditions of Turkey, the Islamic Republic of Iran and the Syrian Arab Republic. The food involves large consumption of meat, especially lamb and chicken. It is also increasingly dependent on carbohydrates, primarily bread and rice, as any meal is rarely served without rice. The Iraqi diet is also characterized by relatively high consumption of vegetables and fruits and moderate amounts of eggs, yogurt, and cheese. However, it includes reduced consumption of fish or seafood (29,30). The region has also witnessed an unprecedented increase in the consumption of fast food. Therefore, the dietary pattern is rapidly changing to a non-healthy diet, which might even increase the problem of obesity and its complications such as cardiovascular diseases (31).
It is well known that hypertension is a disease that runs in the family, but unlike other studies, this study showed an insignificant association between hypertension and positive family history. It is possible that the participants lacked knowledge about the actual health status of their family members. Moreover, the environmental and lifestyle factors might have more effect on developing hypertension than the family history. Several studies from Iraq and other countries have revealed a significant association between hypertension and positive family history (11,24,32).

Sedentary lifestyle and lack of regular physical exercise were also significantly associated with high prevalence of hypertension. Being physically inactive also leads to increase body weight, which in turn leads to increase in blood pressure level. Several other studies have shown that sedentary lifestyle and lack of physical exercise are important risk factors for developing hypertension (24,33).

Limitations

The study is limited by having the sample consisting mainly of female participants. The household visits were conducted during daylight hours when most male members of the household might be out. We could not make follow-up visits to the households to interview the absent male adults due to logistical difficulties, such as lack of adequate funding and adequate time available. Visiting the households for the survey purpose in the evening hours is also culturally not preferable in this locality. Another potential limitation of this study could be the potential effect of white coat and masked hypertension on real prevalence. This problem is related to the variability of a patient’s blood pressure measurement between the physician’s office and the patient’s home environment. To limit the effect of these factors, we measured the blood pressure in the homes of the participants on two occasions and only after administering the questionnaire in a friendly manner. Another limitation of this study is not including important risk factors for cardiovascular diseases such as the lipid profile. We avoided including data that needed taking blood samples and laboratory investigations due to financial constraints and the possibility of having participants refuse to provide consent when using invasive procedures.

Conclusions

The prevalence of hypertension in Erbil city is relatively high and with a high prevalence of undiagnosed hypertension. Compliance with treatment was relatively high, but access to drugs is mainly from private pharmacies. Hypertension was significantly associated with increasing age, being male, unemployment and obesity. This high prevalence of hypertension in Erbil city necessitates effective preventive and control measures, including comprehensive health education activities, screening programmes, encouraging optimal and healthy lifestyles and facilitating the access to free or subsidized antihypertensive treatment.
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References


15. Fisher ND, Williams GH. Hypertensive vascular disease. In: Kasper DL, Braunwald E,


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