Original Article

Relationship between Patients' Awareness on Hypertension and Adherence to Medication among Hypertensive Patients in Saudi Arabia

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ABSTRACT

Background: The purpose of this study was to assess the relationship between awareness on hypertension (HTN)and its management, and adherence to medication among hypertensive patients in Jeddah, Saudi Arabia. **Method:** 243 patients diagnosed with hypertension (HTN) and treated with hypotensive drugs for at least 1 year were included in the study. Sample was obtained from general medicine clinic at King Abdulaziz University Hospital in Jeddah, Saudi Arabia. We used the 8-item Medication Adherence Scale (MMAS-8) and the Hypertension Knowledge-Level Scale (HK-LS) to assess the relationship between Patients' Awareness on HTN management and Blood Pressure Control. **Results:** Sixty-two percent of the patients had low level of knowledge on HTN. Only 12% of participants gave correct answers for items related to non-pharmaceutical treatment, diet, hypertension definition, and drug adherence. When compared to patients with a high level of knowledge, those with a low knowledge had lower scores in the MMAS (6.25±1.35 vs 7.18±1.06; P=0.048). Multiple-factor analysis showed that statistically significant independent determinants of good adherence included a high level of knowledge (β=0.208; P=0.001), non-pharmaceutical treatment (β=0.182; P=0.006), and frequent blood pressure measurements (β=0.183; P=0.004). The most significant factor in MMAS was knowledge in the "medication adherence" domain (ρ=0.303; P,0.001). **Conclusion:** Patients' awareness on hypertension is a significant independent determinant of good blood pressure control. Other independent determinants include non-pharmaceutical treatment and regular blood pressure measurements. The identification of knowledge deficits as a factor contributing to lack of adherence and poor blood pressure control.

Keywords: Adherence to medication, Awareness, Blood Pressure, Control, Knowledge

INTRODUCTION

Hypertension (HTN) is a major risk factor for morbidity and mortality.[1] Although it is a preventable and usually treatable disease but uncontrolled hypertension can lead to many serious and life-threatening complications such as heart, kidney and brain diseases which in most cases result in patient's disability.[2-3] Hypertension has a significant economic impact ranging from medical costs to human capital loss and decrease in productivity.[5,6]

Global analysis showed that the number of people with uncontrolled hypertension (>140/90 mm of Hg) increased from 600 million in 1980 to nearly 1 billion in 2008 and this number is expected to rise to 1.56 billion by 2025, which means 29% of the world adult population will have hypertension.[7]

This serious increase in the incidence of hypertension is significantly associated with a combination of many factors, including family history,[8] lifestyle, dietary habits and environmental factors.[9]

In Saudi Arabia, hypertension is increasing in prevalence affecting more than one fourth of the Saudi population.[10-14] This increase is attributed to several factors such as lifestyle change in Saudi Arabia towards urbanization, unhealthy dietary habits, and obesity. Epidemiological studies worldwide has shown that increased awareness, follow up and control of HTN has resulted in a decreased tendency to morbidity and mortality from cardiovascular disease among hypertensive patients.[15] To achieve better level of improvement in patients' awareness, compliance and blood pressure control, community-based studies on the risk factors, control methods, control levels, lifestyle, adherence to medication, and awareness will be crucial for setting effective control strategies in Saudi Arabia.

In this study we assessed awareness of hypertension and adherence to medication among hypertensive

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MATERIALS AND METHODS

Participants

The study was performed in King Abdulaziz University Hospital in Jeddah. Data were collected from January 2017 through July 2017. Eligible patients were consecutively selected by the physicians, who informed them of the study objectives and recruited all patients who agreed to participate. All the study participants gave informed consent. The survey included 243 patients (133 females and 110 males) aged between 30 and 80 years (mean age 53±15 years) diagnosed with hypertension at least 1 year before (which is in line with the ESH guidelines),16 treated for hypertension with at least one hypotensive agent, and who had been patients of the health center for at least 6 months.

The inclusion criteria were as follows: 1) clinically confirmed hypertension diagnosis, 2) the patient's written informed consent, and 3) age >18 years. The exclusion criteria were as follows: 1) moderate to severe dementia (defined as mini-mental score <15),17 2) lack of consent, and 3) patients with severe concomitant diseases, which could affect adherence to therapeutic guidelines, were excluded from the study due to their complex treatment schemes and the possibility of adverse effects and reactions occurring as a result of the use of multiple medications. Patients were selected by random sampling. The sample group was homogeneous and could be subjected to statistical analysis.

Patients were divided into two groups based on their knowledge level. The patients' knowledge was assessed using the Polish version of the Hypertension Knowledge-Level Scale (HK-LS). According to the asymmetrical answer distribution, the group was divided into two subgroups depending on the score:

1. <17 points – low level of knowledge on hypertension (n=135).
2. between 18 and 22 points – high level of knowledge on hypertension (n=86).

Ethical consideration

The study was approved by the Bioethics Committee. All patients recruited to the study provided their informed and voluntary written consent to participate in the study.

Instruments:

All patients were interviewed by trained medical students, using two validated scales: the 8-item Morisky Medication Adherence Scale (MMAS-8) and the Hypertension Knowledge-Level Scale (HK-LS), both were translated to Arabic language to insure good understanding of questions.

Furthermore, all patients' medical records were analyzed to gather detailed information.

Adherence

Self-reported medication adherence was assessed using the MMAS-8, previously translated to Arabic language and validated. Self-reported MMAS-8 is simple to administer and is feasible and economical in clinical practice. The MMSA-8 was designed to facilitate the identification of barriers to and behaviors associated with adherence to chronic medication.[18,19] The tool has been confirmed as reliable and significantly associated with BP control in individuals with hypertension, as well as with antihypertensive medication pharmacy fill rates. MMAS-8 scores may range from 0 to 8, with scores of <6, 6–8, and 8 reflecting low, medium, and high adherence, respectively.[20]

Knowledge

The HK-LS assessed respondents' knowledge in defining hypertension, lifestyle, medical treatment, drug compliance, diet, and complication of hypertension. Each item was a full sentence that was either correct or incorrect. And each item was prepared as part of a standard answer (correct, incorrect, or do not know). The scale included 22 items divided into six subdimensions. The expressions are incorrect in nine items. Each correct answer is worth 1 point. Incorrect statements are encoded inversely to the other items. The maximum score is 22 for the entire scale. The minimum score is zero for the entire scale and for all subdimensions.[21]

Statistical Analysis

The level of knowledge was evaluated by the HK-LS questionnaire. The maximum score was 22 points. The following classification criteria were used: less than 17 points - low level of knowledge on hypertension, points between 18 and 22 – high level of knowledge on hypertension.

For quantitative variables, the normality of empirical distributions was verified using the Shapiro–Wilk test. Subsequently, mean values and standard deviations were calculated, and mean values were compared between the two patient groups in one-way analysis of variance. Qualitative and ordinal variables were grouped in contingency tables. The independence of qualitative characteristics was verified using Pearson's chi-squared test. The strength of correlations was determined by calculating Spearman's rank correlation coefficients (ρ) and significance levels (P).

The correlation of the independent variables of adherence was tested in multiple linear regression analysis using the forward stepwise method. The statistical significance of variables in the model was verified using Student's t-test. A p-value of <0.05 was considered statistically significant. Calculations were performed using the SPSS Version 16 software.

RESULTS

Patient characteristics

A total of 243 patients were studied, 60% showed a low level of knowledge on hypertension. In the sociodemographic analysis, the only factor for which differences were found was the patients' education level. The majority of patients with a low level of knowledge on hypertension were illiterate (83.7% vs 11.1%; P=0.045).

Analysis of the patients' clinical characteristics showed that the low knowledge level group had a higher rate of ischemic heart disease (42.3% vs 13%; P=0.01). A total of 55.6% patients with a low knowledge level and 26.8% patients with high knowledge level group had elevated BP (systolic >140 mmHg and/or diastolic >90 mmHg). Ten percent of patients with a low knowledge level and fifty-six percent of patients with high knowledge level had their BP checked at least daily/weekly. Patients with low knowledge level had less often stated that they owned a BP meter than patients with high knowledge level (30.5% vs 77.1%).

Characteristics of adherence and awareness Most participants had moderate adherence scores, but in group with low knowledge level, they have lower adherence than in group in high knowledge level MMAS (3.85±1.45 vs 7.99±1.04; P=0.038). However, the low knowledge level group included significantly more low-adherence patients than the group with a high level of knowledge (17.7% vs 9.1%; P=0.023).

In regards to HK-LS, patients with a low knowledge level answered correctly significantly less frequently than those with a high knowledge level (P,0.01), the only exception being item 6, with a similar proportion of correct answers in the two groups (P.0.05).

The analysis of questionnaire answers showed that in the low knowledge level group, the largest proportion of wrong answers was provided for items on non-pharmaceutical hypertension treatment, and the lowest scores were obtained in the "diet" section (0.39±0.74 vs 1.31±0.93; P,0.001), then in the "definition" (1.70±0.65 vs 1.92±0.28; P=0.012) and "drug adherence" (2.19±1.14 vs 3.40±0.69; P,0.001) section. The highest scores were obtained in the "complications" section (5.05±1.46 vs 6.93±0.26; P,0.001). The total score in the low knowledge level group was 14.8±3.7 and that in the high knowledge level group was 19.7±1.3.

Correlation analysis showed that variables having a significant positive effect on adherence included regular BP measurement (ρ=0.181, P=0.009); keeping a self-control diary (ρ=0.019, P=0.007); adherence with non-pharmaceutical hypertension treatment (ρ=0.182; P=0.006); and a high level of knowledge on hypertension (HK-LS) (ρ=0.173; P=0.008).

Statistically significant independent determinants of good adherence include a high level of knowledge on hypertension (β=0.298; P=0.001), non-pharmaceutical hypertension treatment (β=0.171; P=0.006); and regular BP measurements (β=0.183; P=0.004). In the entire study group, a significant correlation between knowledge and adherence was observed. Higher knowledge levels were correlated with better adherence, that is, higher MMAS-8 scores (ρ=0.188; P=0.007)

DISCUSSION

Poorly controlled or untreated hypertension causes gradual irreversible organ damage, leading to life-threatening complications or even death. Hypertension treatment involves continued drug administration, as well as lifestyle modifications and adherence with a complex set of therapeutic recommendations: reduced salt and animal fat intake, weight reduction, and regular exercise. Poor knowledge on adherence to the treatment plan negatively affects patient awareness and behaviors and poses a significant problem in hypertension control. Knowledge and education are considered crucial for proper hypertension control.[22] In this study, as many as 60% of patients showed a low level of knowledge on the definition, treatment, and complications of hypertension. Other published studies confirm the poor knowledge on hypertension among patients and a lack of appropriate education promoting the understanding of hypertension.[23-25]

Among participants in our study, knowledge was poorest with regard to diet and adherence and best with regard to complications. In a study by Eshah and Al-Daken,[26] the lowest knowledge levels were found in the "diet" domain, as in the present study, and in the "definition" domain, in contrast to this study. Furthermore, contrary to this study, other authors reported highest knowledge levels in the "lifestyle" and "drug adherence" domains.[27] According to other authors, being hypertensive increases the patient's level of knowledge regarding the illness and motivation to learn more. In the present study,[28,29] all patients had been diagnosed with hypertension at least 1 year before, and more than half of them still showed an unsatisfactory level of knowledge on the definition, treatment, and complications of hypertension. In the low knowledge level group, only 59% of questionnaire items were answered correctly, with the lowest correct answer percentage in the "diet" domain.

Nearly 20% of patients with a low knowledge level and 8% of patients with a high knowledge level had low adherence scores. The present findings corroborate those by other authors, reporting lack of adherence among patients with hypertension at 23% and 29%,[30,31] with better results among patients who were more knowledgeable on the disease.

In the study by Karaeren et al,[32] knowledge on the causes of hypertension and reasons for hypotensive treatment was positively correlated with medication adherence. In the present study, the overall knowledge score and the "drug adherence" domain score were positively correlated with medication adherence. In other studies, knowledge on hypertension complications was not found to be correlated with adherence, which is surprising, as it could be assumed to be the primary motivation for changes in behavior.[32] In the present study, knowledge was the highest in the "complications" domain in both groups, and the score in this domain was a predictor of good adherence. In this aspect, the present findings differ from other published reports, where patients were interested in short-term problems related to hypertension (symptoms and adverse effects of treatment) rather than long-term complications.[33-35] In the current study, single- and multiple-factor analyses showed significant correlation of knowledge in the "drug adherence" domain on actual medication adherence. In this study, the impact of adverse effects of treatment was not assessed; however, the "drug adherence" domain was a determinant of high adherence. Items comprised in the "drug adherence" domain are consistent with the correlation between non-pharmaceutical treatment for hypertension (salt restriction and exercise) and self-reported medication adherence, found in this study. Patients complying with non-pharmaceutical treatment recommendations were found to have better adherence to pharmaceutical treatment.

Blood pressure control involves such aspects as regular medication-taking, BP measurements, and keeping a diary of self-control.[35] In the present study, regular BP measurements and diary of self-control keeping were confirmed to be predictors of high medication adherence.

Medication adherence is crucial to hypertension control and cardiovascular complication prevention. Concurrent ischemic heart disease is a significant independent negative determinant of medication adherence. In a study by Zhao et al,[36] 38.4% of patients with ischemic heart disease failed to comply with treatment, and poor knowledge on treatment and complications was correlated with poor medication adherence. The negative correlation between ischemic heart disease and patients with hypertension knowledge could, or should, be explained by the frequent occurrence of ischemic heart disease as a complication of untreated hypertension.[37] Only effective communication and education can influence the regular BP control and the adherence to therapeutic recommendations.

CONCLUSION

Knowledge on hypertension is a significant independent determinant of good adherence.

Other independent determinants include salt restriction and regular BP measurements. A multidisciplinary approach and the development of intervention programs focused on promoting patient knowledge and healthy behaviors are significant components of care, contributing to better adherence and control.

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