

Hypertension in Relation with Smoking in Azadi Teaching Hospital at Kirkuk City

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Abstract

Background: smoking and hypertension are two common health problems effecting body organs and increasing morbidity and mortality.

Aim of Study: determining the relationship between smoking and hypertension, the affect of the amount and duration of smoking on the severity of hypertension and complications of smoking among hypertensive patient.

Patient and Method: the study is cross sectional, in which 200 hypertensive patient were collected in Azadi Teaching Hospital in Kirkuk. There blood pressure was measured and the patients were asked about smoking habits, and if they have complication of hypertension.

Results: hypertension is more common among male, married, illiterate and primary educated, intermediate socioeconomic state, physically inactive and more in urban than rural area. Uncontrolled rate of hypertension is high in both smokers and non smokers and this rate increase with increase with increasing duration of smoking. Heart and cerebrovascular complications of hypertension is very high in smokers compared with non smokers. P-value less than 0.05 regard as significant relationship.

Conclusion: very low control rate of hypertension in both smokers and non smokers. We recommended public health education via mass media regarding the side effect of smoking combined with hypertension and it's complications.

Keywords: *Smoking, Hypertension, Blood pressure, Tobacco*

Introduction

Elevated blood pressure and tobacco smoking are, respectively, the first and second leading causes of preventable mortality worldwide(1). Hence, from both a population perspective and a patient perspective, the joint occurrence of tobacco smoking and elevated blood pressure has enormous health consequences. Worldwide, the absolute number of tobacco smokers has increased because of population growth, despite a decrease in the age-adjusted prevalence of smoking(2). In the United States, the estimated number of tobacco smokers has dropped, as a result of tobacco-control efforts, from 45.1 million in 2005 to 36.5 million smokers in 2017 (3) . However, while use of tobacco products has decreased, use of electronic cigarettes (e-cigarettes) has increased substantially in the United States, along with

concerns about their potential health risks(4). Tobacco smoking and e-cigarette use may raise blood pressure and accelerate atherothrombotic processes though a variety of potential mechanisms, including deleterious effects on endothelial function, inflammation, lipids, and thrombosis(5) . The effects of smoking on blood pressure and hypertension are discussed in this topic. Hypertension control and smoking cessation to prevent cardiovascular disease and the approach to smoking cessation are discussed elsewhere.

The effects of tobacco smoking on blood pressure are complex, with evidence that tobacco smoking increases blood pressure acutely and increases the risk of renovascular, malignant, and masked hypertension. Passive (or secondhand) smoke exposure also appears to raise blood pressure(6).

The aims of the study :

Clarify the relationship between smoking and Hypertension .

Identify the relationship between the amount and duration of smoking and the severity (Stage) of hypertension in comparing with non – smokers .

Identify the cardiovascular complications of smoking in hypertension patients.

Patients and methods:

The design of the study :- The design of the study was cross sectional study . The place of study was the center of Azadi Teaching Hospital in Kirkuk city.

The duration of the study : - The duration of the study was extended from March 2018 till September 2018.

Sample / population : - Patients were visiting Azadi Teaching for diagnosis , treatment and follow up purposes . The sample size was 200 , all patients were hypertensive with two criteria of diagnosis : First one any patient with blood pressure more than 140 / 90 mm Hg in two different occasions (each 10 minutes apart) ; The second criterion was any patient on antihypertensive drug even with normal blood pressure . Information was also taken from patients about smoking habits , to determine the relationship between smoking and severity (stage) of hypertension and the effect of smoking on hypertension complication like cardiovascular and cerebrovascular complications .

The systolic and diastolic blood pressure was measured by a random zero mercury type sphygmomanometer on both arms (each five minutes apart) . The mean value of the two readings was calculated . The blood pressure measuring was after asking patients to rest for 30 minutes , and if the patient was a smoker , to stop smoking for 30 minutes before measuring blood pressure .

The questionnaire : The questionnaire was designed to contain the following major questions that meet with the aims of the study :

Sociodemographic questions: -

Sociodemographic questions, which contains the name of the patients , age , sex , marital status , physical activity , residence , educational level , and

economic state.

Questions about history of medical diseases :- Questions about history of medical diseases to determine the secondary causes of hypertension , and to exclude the other risk factors for the major complications of hypertension. These questions include asking about diabetes mellitus , ischemic heart disease , drug history , bronchial asthma , cerebrovascular accidents , chronic obstructive pulmonary disease , and surgical history .

Questions about the complications of hypertension:- Questions about the complications of hypertension including ischemic heart disease , left ventricular hypertrophy , a trial fibrillation protein urea , renal failure , stroke , and retinopathy .

Questions about smoking :- Questions about smoking , including the number of smoking per day and the duration of smoking .

The questionnaire also contained the measuring of vital signs : - The questionnaire also contained the measuring of vital signs including systolic and diastolic blood pressure , heart rate , and respiratory rate .

Statistical methods : - The sample was chosen by simple random sampling , the data was analyzed with the using statistical package for social sciences (SPSS Ver.23) program , standard methods were used to obtain summary statistics such as means , prevalence and other measures.

Ethical consideration : - All the studied individuals were asked whether they were interested in the study or not . All agreed voluntarily to participate .

Results

In this study we explored 200 hypertensive cases , the mean age was 55 , the range of the age was from 32 – 88 , the high portion of age from 43 – 64 year with a percentage of 64% male more than female , married more than single ,the urban area more than rural ,not educated more than educated as its illustrated in (Table 1) ,with high proportion of intermediate economical state and low physical activity.

Smoking and hypertension: From total 200 cases , 143 was non – smoker in a percentage of 71.5%, and 57 was smokers in a percentage of 28.5%.The relationship between smokers habit and different stages of hypertension is showed in (Table 2).

The effect of duration of smoking on stages of hypertension: In this relationship we notice that the uncontrolled systolic BP group are in the duration of 10 – 19 years , while the larger number of controlled diastolic BP group in the duration of less than 10 years , and this adverse relationship between duration and hypertension can be clarify by the effect of another factors like physical inactivity or inappropriate pharmacological treatment as showed in (Table3).

The effect of the a mount of smoking on stages of hypertension: The uncontrolled hypertensive cases

increase with the amount of smoking with larger number in those who smoke more than 20 cigarette per day as in (Table 4).

The effect of smoking on heart and cerebrovascular complications in hypertensive patients in relationship with non-smokers: In both (Table 5) and (Table 6), it is very clear that both heart and cerebrovascular complications increase in smoker patients. The percentage of heart complications in smokers to non-smokers are 47% to 0.6% ,also the same percentage regarding the cerebrovascular complications .

Table 1 . Socio – demographic characteristics .

| % | N | Variables |
|-------------------|-----|------------------------|
| Age groups | | |
| 12.5 | 25 | 32 – 42 |
| 33.5 | 67 | 43 – 53 |
| 30.5 | 61 | 54 – 64 |
| 15.5 | 31 | 65 – 75 |
| 8 | 16 | 76 – 88 |
| Sex | | |
| 52.5 | 105 | Male |
| 47.5 | 95 | Female |
| Marital status | | |
| 24.5 | 49 | Single |
| 75.5 | 151 | Married |
| Residence | | |
| 85.5 | 171 | Urban |
| 14.5 | 29 | Rural |
| Educational level | | |
| 66 | 132 | Illiterate and primary |
| 24.5 | 49 | Secondary |
| 9.5 | 19 | High |
| Economical state | | |
| 28 | 56 | Low |
| 63 | 126 | Intermediate |
| 9 | 18 | High |
| Physical activity | | |
| 63 | 126 | Inactive |
| 32.5 | 65 | Mild activity |
| 4.5 | 9 | Regular activity |

Table 2. Smoking and hypertension

| Systolic BP (mm Hg) | | | | | |
|------------------------|------------------|----------------------|----------------------|----------------------|-------------|
| Total | > 179 N (%) | 160 – 179 N (%) | 140 – 159 N (%) | 120 – 139 N (%) | |
| 143 | 92 (64) | 41 (29) | 10 (7) | 0 (0) | Non smokers |
| 57 | 26 (45.7) | 11 (19.2) | 5 (8.7) | 15 (26.3) | Smokers |
| Diastolic BP (mm Hg) | | | | | |
| Total | > 109 | 100 - 109 | 90 - 99 | 80 - 89 | |
| 143 | 19 (13.2) | 84 (58.7) | 40 (28) | 0 (0) | Non smokers |
| 57 | 7 (12.2) | 22 (38.5) | 13 (22.8) | 15 (26.3) | Smokers |
| P - Value = 0.001 | | | | | |

Table 3. Duration of smoking and hypertension .

| Systolic BP (mm Hg) | | | | | Duration |
|------------------------|------------------|----------------------|----------------------|----------------------|---------------|
| Total N (%) | > 179 N (%) | 160 – 179 N (%) | 140 – 159 N (%) | 120 - 139 N (%) | |
| 15 (26.3) | 2 (13.3) | 2 (13.3) | 1 (6.6) | 10 (66.6) | < 10 years |
| 33 (58) | 18 (54.5) | 8 (24) | 3 (9) | 4 (12) | 10 – 19 years |
| 9 (15.7%) | 6 (67) | 1 (11) | 1 (11) | 1 (11) | ≤ 20 years |
| Diastolic BP (mm Hg) | | | | | |
| Total N (%) | > 109 N (%) | 100 – 109 N (%) | 90 – 99 N (%) | 80 – 89 N (%) | |
| 15 (26.3) | 3 (20) | 4 (26.6) | 0 (0) | 8 (53.4) | < 10 years |
| 33 (58) | 12 (37) | 10 (30) | 5 (15) | 6 (18) | 10 – 19 years |
| 9 (15.7) | 1 (11) | 7 (78) | 0 (0) | 1 (11) | ≤ 20 years |

P - Value = 0.001

Table 4 . Number of smoking and hypertension .

| Systolic BP (mm Hg) | | | | | Number of cigarettes / day |
|------------------------|------------------|----------------------|----------------------|----------------------|----------------------------|
| Total N (%) | > 179 N (%) | 160 – 179 N (%) | 140 – 159 N (%) | 120 – 139 N (%) | |
| 7 (12.2) | 1 (14.2) | 1 (14.2) | 3 (42.8) | 2 (28.8) | < 10 |
| 15 (26.3) | 7 (46.6) | 1 (6.6) | 2 (13.3) | 5 (33) | 10 – 19 |
| 35 (61.5) | 18 (51.5) | 9 (25.7) | 0 (0) | 8 (22.8) | <20 |
| Diastolic BP (mm Hg) | | | | | |
| Total N (%) | > 109 N (%) | 100 – 109 N (%) | 90 – 99 N (%) | 80 – 89 N (%) | |
| 7 (12.2) | 0 (0) | 0 (0) | 0 (0) | 7 (100) | < 10 |
| 15 (26.3) | 2 (13.3) | 4 (26.6) | 4 (26.6) | 5 (33.5) | 10 – 19 |
| 35 (61.5) | 7 (20) | 21 (60) | 4 (11) | 3 (9) | < 20 |

P - Value = 0.001

Table 5. Smoking and heart complications

| % of Complications | Total N (%) | Heart complications | | No complications N (%) | Smoking habit |
|--------------------|---------------|---------------------|-------------------|-----------------------------|---------------|
| | | MI N (%) | Angina N (%) | | |
| 0.6% | 143 (71.5) | 3 (2) | 6 (4) | 134 (94) | Non smokers |
| 47% | 57 (28.5) | 3 (5.2) | 24 (42) | 30 (52.8) | Smokers |

P – Value = 0.001

Table 6. Smoking and cerebrovascular complications.

| % of complicat-ions | Total N (%) | Cerebrovascular complications | | | No complications N (%) | Smoking habit |
|---------------------|-------------|----------------------------------------|-----------------------|----------------|-----------------------------|---------------|
| | | Hypertensive encephalopathy N (%) | Infarction N (%) | T I A N (%) | | |
| 0.6% | 143 (71.5) | 3 (2) | 4 (3) | 2 (1.3) | 134 (93.7) | Non Smokers |
| 47% | 57 (28.5) | 2 (3.7) | 5 (8.7) | 20 (35) | 30 (52.6) | Smokers |

P – Value = 0.001

Discussion

This study clarified several findings in the relationship between smoking and hypertension, the effect of smoking on the complications of hypertension, and the relationship of sociodemographic characteristic and hypertension. All these facts are important in controlling of hypertension and reducing the complications of hypertension in relationship with smoking.

In the study the main age group of patients are between 43 – 64 years with a percentage of 64%, the mean age is 55, the proportion of male is higher than female with a percentage of 53%, these results are similar to those in USA(7) that hypertension prevalence increase with age and more in male due to reduced vascular compliance that the prevalence of hypertension increases greatly with age, changing from 15.2% of 18 – 24 years – olds to 60.2% of 65 to 74 years.

The study showed that all 143 non- smoker were poorly controlled hypertension, i.e., all of them with blood pressure more than 140 / 90 mmHg, while within 57 smoker patients there are 15 cases with control blood pressure. This poor controlled blood pressure among non – smokers may related to other factors like physical inactivity, obesity, stress, inappropriate treatment.

The amount and duration of smoking affect adversely on the controlling of blood pressure, the study clarified that the uncontrolled rate for those patients smokes more than 20 cigarette / day is 76 % for systolic and 91 % for diastolic blood pressure, and similar uncontrolled rate for those smoking for more than 20 years with a percentage of about 88 % for both systolic and diastolic blood pressure. This result is similar to that study in Vietnam(8) that smoking rises blood pressure acutely and the level return to baseline in about 15 minutes. And if a person smokes more than 30 cigarettes / day this can elevate the blood pressure continuously(8).

The study clarified that the cardiac complications of hypertension (including angina and myocardial infarction), and cerebrovascular complications (mainly transient ischemic attack and cerebral infarction) are very high in smokers with a percentage of 47% in comparing with very low percentage of 0.6% in non-smokers.

Conclusions

The major conclusions of the study are : Poor blood pressure control present in the majority of the patients with a percentage of 93% the uncontrolled blood pressure was mainly in males, married, illiterate and primary educated, low physical activity persons, intermediate socioeconomic state and more in urban than rural areas. High blood pressure was in both smokers and non – smokers. The heart and cerebrovascular complications of the hypertension increase in smokers compared with non – smokers.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Kirkuk Health Directory, Iraq and all experiments were carried out in accordance with approved guidelines.

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