DOI Number: 10.37506/v20/i1/2020/mlu/194333

Hypertension Control in Diabetic Patients

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Abstract

Background: Diabetes mellitus is one of the commonest diseases world wild and can cause multi-systemic complications, hypertension can co-exist with diabetes and predispose to diabetes complications, both micro and macro-vascular.

Objectives: The objectives of this study are to assess the incidence of hypertension in diabetic patients and whether they are controlled or not.

Subjects and Method: This is a community-based descriptive cross-sectional study done in Azadi teaching hospital in Kirkuk city from the period of September 2014 until February 2016, 240 diabetic patients were collected using a questionaire, containing details of his condition.

Rusults: The study had showed that in which 57% of patients were with high blood pressure, 32% with normal blood pressure and 11% with low blood pressure, most of the hypertensive patients were uncontrolled, and most of the diabetic patients were non-smokers and 55% of them were with non-sedentary life style, but the majority of them were overweight and obese.

Conclusions: The study agrees with a lot of studies that hypertension is more common in diabetic patients, especially in those who are obese and smokers and most of them are uncontrolled hypertensive.

***Key Words**: Diabetes mellitus, hypertension, smoking, BMI*

Introduction

Diabetes mellitus is one of the most common a clinical syndromesin which hyperglycaemia happens as a result of absolute or relative deficiency of insulin. Carbohydrate, protein and fat, water and electrolyte metabolism all are affected due to insulin defficiency. Functional and strucural changes in many organs particularly those of the vascular system, which lead to the clinical complications of diabetes. These characteristically affects the nervous system, the eye, vascular system and kidney.(1)

There are two main types of diabetes mellitus, type 1, occur as a result of extensive damage to pancreatic beta-cells and will affect the pancreatic insulin secretory capacity and the patient will depend on exogenous insulin. Type 2 , which is much more common than type 1,there is some endogenous insulin secretory capacity; however their insulin secreation levels are low relative to their ambient glucose levels and magnitude of insulin resistance. (2)

Many factors contribute to the diabetes mellitus complication, e.g : diabetes control, smoking, hypertension.

Hypertension is a condition in which arterial blood pressure is chronically elevated. Blood pressure occurs within continues range ,so cut off levels are defined according to their effect on patients' risk. (3)

Diabetes mellitus and hypertension are interrelated diseases that strongly predispose an individual to atherosclerotic cardiovascular disease. Hypertension is about twice as frequent in individuals with diabetes as in

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those without.(4)

Hypertension and diabetes are a critical combination for the development of both micro- and macro vascular disease.

Cardiovascular diseases is the major cause of mortality in diabetes mellitus. (4)

The prevalence of coexisting hypertension and diabetes appears to be increasing in industrialized nations because populations are aging and both hypertension and NIDDM incidence increases with age. (5)

An estimated 35% to 75% of diabetic cardiovascular and renal complications can be attributed to hypertension. For all these reasons, hypertension and diabetes should be recognized and treated early and aggressively. (1)

Subjects and Methods

This is a community-based descriptive cross-sectional study done in Azadi teaching hospital in Kirkuk city from the period of September 2014 until February 2016.

Data were collected from total number of 240 diabetic patients using structured questionnaires; the questionnaires were prepared in English and local languages questions were prepared (Arabic, Kurdish and Turkish).

The questionnaire contains important questions, type of diabetes, type of treatment, duration of diabetes, his diabetes is controlled or not, whether he is hypertensive or not, type of treatment, smooking history, sedentry lifestyle, body mass index (BMI) was measured for each patient.

Hypertension in diabetic patients was confirmed if systolic BP was equal or more than 130 mmHg and or diastolic BP equal or more than 80 mmHg on 2 occasions separated by at least 1 day or more, or on medications for hypertension.

Results

The study ended by collecting information from 240 patients have diabetes mellitus with its both types, 57% of which were females and 43% were males and the age for them was above 61 years old with a percentage of 42% of complete 240 patients.

Most of them (43%) had gained diabetes since 5 years ago, 23% were diabetic since 5-10 years, 22% snice 10-15 years,and 12% were diabetic since >15 years.

90%of the patients are type two diabetes mellitus. the large population of them 73% are not controlling their diabetes also 54% of them don't have a family history of the disease.

Blood pressure measurements of the diabetic patients showed that 57% of them were with high blood pressure, 32% with normal blood pressure, and 11% with low blood pressure.

Table 1 shows the Distribution of study subjects according to age and diabetic patient with hypertension, diabetic patients < 30 years old were 6 , non of them were hypertensive, patients aged (31-40): 9, 3 patients hypetensive, patients aged (41-50): 39, 16 patients were hypertensive, patients aged (51-60): 86, 40 patients were hypertensive, patients aged > 60 years old : 100, 70 patients were hypertensive.

Table 2 shows the distribution of study subjects according to hypertension and blood pressure measurement, high blood pressure was recorded in 83 patients (from total 128) of those who have diabetes and hypertension, and in 24 patients (from total 112) who have diabetes without hypertension.

206 patients (86%) were nonsmookers and 34 (14%) were smookers, 108 patients (45%) were with sedentary lifestyle and 132 (55%) with non sedentary life style.

The percentage of patients with controlled DM : 66 (27%) and uncontrolled DM : 173 (73%).

The ratio between the diabetic patients who are hypertensive : 129 (54%) and the others who don't : 111 (46%).

66 DM patients were controlled, in which 32 of them were hypertensive and 34 not hypertensive. 174 patients were uncontrolled DM, in which 97 were hypertensive and 77 not hypertensive.

According to these findings, relation between diabetic patients with or without hypertension and control of diabetes is not significant. Chi square =0.971 , d.f=2 , p>0.05

Table 4 shows the Distribution of study subjects according to hypertension and body mass index (BMI) measurements, low BMI (< 18.5) only 2 patients, both of them were just diabetic wihout hypertension.

Normal BMI (18.5 – 25), 48 patients, 20 of them were diabetics and hypertensives and 28 were just diabetics without hypertension.

Overweight (BMI 25 – 30), 90 patients, 49 were diabetic and hypertensives and 41 just diabetic without hypertension.

Obese (BMI > 30), 100 patients, 61 were diabetic and hypertensives and 39 just diabetic without hypertension.

Table 1 shows the Distribution of study subjects according to age and diabetic patient with hypertension.

Age	Diabetic & hypertensive	Diabetic only	Total
<31	0	6	6
31-40	3	6	9
41-50	16	23	39
51-60	40	46	86
>61	70	30	100
Total	129	111	240

Chi square =23.19 d.f=4

P<0.05

Table 2: shows the Distribution of study subjects according to hypertension and blood pressure measurements.

	Low	Normal	High	Total
Diabetic+hypertensive	2	43	83	128
diabetic only	20	68	24	112
total	22	111	107	240

Chi square =52.01

d.f=2

p<0.05

Table 3: shows the Distribution of study subjects according to hypertension and sedentary lifestyle

	Sedentary life style	Non sedentary life style	Total
Diabetic + hypertensive	64	65	129
Diabetic only	70	41	111
Total	134	106	240

According to the table relation between diabetic patients with or without hypertension and sedentary life style is significant.

Chi square =4.2 , d.f=1 , p<0.05

Table 4: shows the Distribution of study subjects according to hypertension and body mass index measurements.

Body mass index	Diabetic and hypertensive	Only diabetic	Total
Low BMI <18.5	**0**	**2**	**2**
Normal BMI 18-25	**20**	**28**	**48**
Overweighed >25	**49**	**41**	**90**
Obese >30	**61**	**39**	**100**
total	**130**	**110**	**240**

According to the table relation between diabetic patients with or without hypertension and body mass index is not significant.

Chi square =7.17

d.f=3

p>0.05

Discussion

As diabetes mellitus is a common metabolic disease and can cause multi-systemic complications, an important factor that can precipitate diabetes complications is hypertension. [6]

This study has found that hypertension was more common in diabetic patients (p <0.05) especially in old age diabetics (>60 years).(6,7,8,9,10)

Most of the diabetic patients had uncontrolled hyperetension (57%), just 32% had controlled blood pressure, (8, 9)

As there are a lot of factors that can predispose to hypertension like smoking and sedentary life style and obesity so these important factors were screened in this study, 86% were non-smoker and 14% smoker, 45% were with sedentary life style and 55% with non sedentary life style. [11,12,13,14,15]

Of the 100 obese diabetic patients 61 were hypertensive and 90 patients were overweight of which 49 were hypertensive. [12,13,14]

Of the 129 diabetic and hypertensive patients, only 32 (27%) were controlled hypertensive and 97 (73%) were uncontrolled hypertensive.(16,17,18,19,20)

Hypertension was more common in diabetic patients, 129 (54%) diabetic patients were hypertensive and 111 (46%) were non-hypertensive. [21,22,23]

Conclusion

Hypertension is more common diabetic patients especially in old aged patients (> 60 years old), and most of the diabetics have uncontrolled high blood pressure.

Factors, such as: smoking, sedentary life style and obesity can all predispose diabetic patients to hypertension.

Recommendations:

Early diagnosis of hypertension and proper treatment with good control to reach ideal blood pressure in diabetic patients.

Educating diabetic patients to avoid smoking and sedentary life style, encouraging them to have regular exercise and eating healthy diet rich in fibers appropriate for diabetes, and have ideal body weight, as this can decrease risk of obesity which is also important risk factor for hypertension.

Avoid alcohol or advise patients to limit alcohol intake to a maximum of two standard drinks per day (men) or one standard drink per day (women) and have at least two alcohol-free days per week.

Ethical Clearance: Official agreement were obtained from the local ethical committee of

Kirkuk health directorate. Informed signed consent was obtained from each participant, data of the patients were collected in accordance with World Medical Association declaration of Helsinki , 2013 as a statement of ethical principles for medical research involving human.

Conflict of Interest : Author declares none

Funding: Self-funded

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