

Control Rate of Diabetic and Hypertensive Adult Patients in Association with Demographic and Healthy Behaviour Factors in Garmian- Kurdistan Region

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Abstract: *Hypertension and diabetes mellitus (DM) are the two major inter-correlated risk factors of cardiovascular diseases, which considered as the major causes of morbidity and mortality. This study is set up to determine control rate, and the social demographic and health related behaviours risk factors in association with control rate in hypertensive and/or diabetes patients who are under treatment. Cross sectional study was carried out in this study. Data have been collected by well-trained paramedics through direct interviews using structured questionnaire with the participants. A conventional sampling which is one of the main types of non-probability method was used for collecting data. SPSS version 16 was used for analysing data. 338 patients were recruited into the study, 150(44.1%) of participants with hypertension, 88(25.9%) with diabetes and the rest 100(29.4%) with both diseases. Patients who diagnosed with hypertension were more under control 83 (55.3%) in comparison with diabetic 23(26.1%) and patients who were diagnosed both conditions 18(18.0%). High control rate was observed in hypertension patients compared to diabetes and those diagnosed both conditions. Cor morbidity was the main cause of uncontrolled rate.*

Keywords: Healthy behaviour, Diabetic patient, hypertensive patient, Demographic data.

1. INTRODUCTION

Hypertension and diabetes mellitus (DM) are two major interrelated risk factors of cardiovascular diseases (CVD), and the main leading causes of mortality and morbidity with highest disability-adjusted life year

(DALY) rate in the national burden of disease globally (1). In addition, diabetes mellitus has a major impact on the cardiovascular system, with the main cause of death being directly related to cardiovascular disease (2,3). Major cardiovascular complications associated with diabetes mellitus include stroke, coronary artery disease, ischemic heart disease, heart failure and myocardial infarction (4,5). The risk of these complications occurring increases with the presence of cardiovascular risk factors.

Another study in Iran has shown approximately 15% of hypertensive patients are suffered from diabetes, and 75% of T2DM patients are complained also with hypertensive (6). While Abbas, (2012) has done a survey in Iraq, reported that Hypertensive diabetic patients have constituted 89.6% of the adult diabetic. However, high prevalence of these two risk factors s are going to be a major public health problem in the area which cause cardio vascular diseases (CVD) and death (7).

Furthermore, some studies have indicated that high blood pressure, diabetic mellitus, obesity and smoking, are the main known risk factors, which report 75% of the leading causes of CVD (7,8). Similarly, socioeconomic inequality (9), Age, sex, education and physical inactivity are other known risk factors of CVD and non-communicable diseases (NCD). In Iraqi survey, prevalence of NCD risk factors has been estimated more than forty percentage in 2006 (10), but this prevalence in Iran is 78% for men and 80% for women (11).

In two different studies in 5578 diabetic patients and 1079 diabetic patients in south Iraq low and different mean of age have shown, 51.4 and 56.3 years (12,13). According to Abbas and Narjis, (2013) study of south Iraq reported that the mean of BMI was high, 28.0 ± 5.4 kg/m² in diabetic patient, and more than 70.6 % are overweight and prevalence of smoking in same studies has been estimated to be 12-25%. As well as women are more likely to be hypertensive or diabetic with men 14. Socio demographic risk factors like early age of onset, obesity, gender are significant indicators of these conditions, diabetic and hypertension, and other NCD e.g. CVD.

Anti-hypertensive medicines have been used as high effective intervention in controlling of hypertension; as secondary prevention by which could decrease risk chronic heart disease (CHD) (10). Despite, medical treatment of hypertension is not always sufficient to achieve controlling blood pressure in Canadian study, 86.4% of patients with hypertension have been treated with antihypertensive medications, while 44.9% of them could control hypertension without using medication (14). Likewise, in Iraq study has found that among hypertensive diabetic, 48.2% of them have controlled their blood pressure (12). Furthermore, in a study in Kurdistan region of Iraq has shown, 95% of hypertensive patients have been controlled under using medicine, while control rate has not reported (11). This study is conducted in -Kurdistan region among hypertensive and/or diabetes patients who are under treatment to determine control rate, and the social demographic and health related behaviours factors in associated with control.

2.MATERIALS AND METHODS

A hospital based cross sectional study was conducted in Garmian, between 15.08.2013 to 31.12.2013. Garmian is a Kurdistan administrative area, with three districts (Kalar, Kifry and Khanaqeen), with number of populations around 250000. This study was carried out in Kalar General Hospital and three primary health centres (Shahid Qasm, Kifry and Pebaz).

2.1. Study population

As a part of Kurdistan Health System strategy for management of chronic diseases, any newly diagnosed chronic disease e.g. CVD, hypertension, DM, asthma, and epilepsy will be referred to a specialist centre according to the geographical area of the patient. Usually, they periodically (every month) receive their medications. In this hospital survey around 5000 patients have been recorded in Kalar General Hospital, 1000 patients in each Kifry and Shahid Qasm Health Centre.

Demographic data such as name, age, sex, name and dose of the drugs have been recorded in the survey. Hypertension, CVD and DM were formed the main diseases in those health centres. However, this study was concentrated only on DM and HTN patients.

2.2. Ethics Approval

The study has been accepted and approved by health preventive directorate at Garmian Health Directorate, and both verbal/ written consents were taken from the patients. The participants were freely to participate in the study after a full explanation in their native Kurdish language.

2.3. Exclusions criterion

Patients with DM, HT, or both of them and equal to/or more than 18 years old were included in this study.

2.4. Tool and measurements

A structured questionnaire was used in this study. Data have been collected by well-trained paramedics through direct face to face structured interview with the participants. The questionnaire included demographic data (age, sex, place of residence and education), socioeconomic and behavioural data (occupation, family income, own a house and/or a car, smoking (current or previous smoker), food consumption and physical inactivity and medical information.

2.5. Physical measurement

Measurements of height, weight and blood pressure were taken for each subject. Validated digital scales have been used for measuring body weight.

2.6. Body Mass Index

Obesity was defined by body mass index (BMI). BMI estimated by dividing body weight (kg)/ the square of the body height in meters (m²). Participants were defined as obese when $BMI \geq 30$ kg/m², and overweight if $BMI \geq 25$ kg m².

2.7. Blood Pressure

Blood pressure had been measured by using a calibrated mercury sphygmomanometer and stethoscope. Uncontrolled of all grades high blood pressure; mild, moderate and sever have been considered when the systolic blood pressure >140 mm/Hg and diastolic >90 mm/Hg.

2.8. Laboratory Tests

A standardized digital glucometer has been used for measuring random blood sugar. Uncontrolled blood sugar defined by random blood sugar >200 mg/dl.

Patients who suffered both conditions; hypertension and diabetic were considered as un-control, if any of those conditions was not controlled.

Cor-morbidity was recorded by self-reported disease to present with any other chronic condition other than diabetes and hypertension which already diagnosed by physician.

Duration of condition was defined by time of onset from diagnosed to the day of collecting of data.

2.9. Statistical analysis

Descriptive analysis of the study population was done and presented in the below tables. Demographic, socio-demographic, and lifestyle data have been considered as independent variables. Control rate across independent variables was found among composed diabetes and hypertension patients and the level of significance was tested by using chi-square. SPSS version 16 was used for analyzing data.

3. RESULTS

Three hundred thirty eight patients with diabetic and/or hypertension were recruited in the study, 150(44.1%) of participants with hypertension, 88(25.9%) with diabetes and the rest 100(29.4%) with both diseases. Male patients were 100(29.5 %) while female patients were 238 (69.6%). The mean age was (58.3±11.5). Participants were mostly illiterate (81.7%). Living without spouse was (18.3%). 182(53.5) of participants were living in family size smaller than 5. Majority having no jobs and not retired 270(79.4%), (Table 1).

Table 1: Demographic data of the participants; age, sex, disease history, diagnosis, education status, occupation and civil status.

Demographic variables	Frequency (%)	Age(yrs) Mean (SD) N=338	Duration of disease since diagnosis Mean(SD) N=338
Sex			
Male	100(29.5)	60.6±10.6	6.2±7.2
Female	238(70.5)	57.3±11.7	6.6±6
Total		58.35±11.5	6.1±6.8
p- value		0.017	0.793
Family size			
Below 5 member	182(53.5)		
5 and above 5 member	156(56.5)		
Marital status			
With spouse	259(76)		
Without spouse	79(24)		
Education			
Literate	68(20)		
Illiterate	270(80)		
Occupation			
Having job or retired	270(82)		
Not having job	68(18)		
Diagnosis			
Hypertension	150(44)	****	
Diabetic	88(26)		
Diabetic and hypertension	100(30)		

Female group mean of BMI was significantly higher (29.8±5.2) (P-value= 0.003), but mean of blood pressure (150.3±20.5) (P-value: 0.23), and random blood sugar (286.8±348) (P-value= 0.20) was not significant compared to the male group. From another side, both risk factors were observed difference within sex, (table 2).

Table 2: BMI, BP and RBS among participants (mean± SD) .

Sex	BMI Mean (SD) N=337	BP (mmHg) Mean (SD) N=338	RBS (mg/dl) Mean (SD) N=338
Male	28±4.3	147.0±19 .6	286.8±348
Female	29.8±5.2	150.3±20 .5	249.9±122
Total	29.2±5.0	149.4±20 .3	260.6±214.1
P-value T- test	0.003 -2.977	.207 -1.265	.232 1.198

Prevalence of previous smoking 36(35.3) and current smoking 20(19.6) were significantly high in male in compared to female, (p-value= 0.00) (p-value= 0.00) respectively. Consuming high vegetable 91(89.2%) and physical exercise 189(17.6%) were high among male, in compare to female, but the only significant difference was observed in physical exercise ((P-value: 0.005), (table 3).

Table 3: The prevalence of habit parameters among participants

Sex	Current Smoker N (%)	Previous smoker N (%)	Consuming high fruit and vegetable N (%)	Physical exercise N (%)	Over weight and obesity (BMI≥ 25) N (%)
Male	20(19.6)	36(35.3)	91(89.2)	189(17.6)	76(75.2)
Female	11(4.6)	27(11.3)	205(86.1)	17(7.1)	192(81.4)
Total	31(9.1)	63(18.5)	296(87.1)	35(10.3)	268(79.5)
P-value	0.00	0.00	0.43	0.005	0.2

e	19.3	27.1	0.60	8.7	1.6
Chi-squ					

High control rate in male, aged below 60 year, having spouse, literate, having job and retired, family size> 5 member, having own house and car. While significant difference was found only in literate (p-value=0.04) and living with spouse (p-value= 0.04) comparatively (Table 4)

Table 4: Distribution of conditional control versus demographic variable.

Sr / No	Variables	Total N	Controlled N (%)	Uncontrolled N (%)	p-value chi-square
1	Sex				
	Male	100	38.0(38)	62.0(62)	.745
	Female	238	86(36.1)	152(63.9)	0.8
2	Age				
	Below 60 years	187	71 (38)	116(62)	0.29
	60 years and above	151	53(35.1)	98(64.9)	0.65
3	Marital status				
	With spouse	259	103(39.6)	156(60.2)	0.042
	Without spouse	76	20(26.3)	56(73.7)	
4	Education				
	Illiterate	267	89 (33.3)	178(66.7)	0.047
	Literate	68	32(47.1)	36(52.9)	4.42
5	Occupation				
	Don't have job	270	98(36.3)	172(63.7)	1.00
	Having job or retired	61	23(37.1)	39(62.9)	0.001
6	Family size				
	Below 5 member	182	64(35.2)	118(64.8)	0.49
	5 and above 5 member	149	58(38.9)	91(61.1)	0.49
7	House ownership				
	Yes	265	101 (38.1)	164(61.9)	0.39
	No	66	21(31.8)	45(68.2)	0.90
8	Car ownership				
	Yes	108	43(39.8)	65(60.2)	0.47
	No	223	79(35.4)	144(64.6)	0.60
	Total	338	124(36.7)	214(63.3)	

Overall control rate for all cases, diabetic and/or hypertension was 124 (36.7%). Patient which diagnosed as hypertension was more likely under control 83 (55.3%) in compared to diabetic 23(26.1%) and patient who was diagnosed both condition 18

(18.0%). This difference was statistically significant at (p-value= 0.00). Cor-morbidity was another significant indicator of this study (p-value: 0.00) in associated with controlling rate among diabetic and/or hypertension patients. A participant who diagnosed with diabetic and hypertension and did not have another chronic condition was reported less control rate 54(51.4). However, effect of medical condition like cor-morbidity, number and availability of drug, healthy behaviour on control rate have shown in Table 4. Body weight was significant indicator (p-value=0.02) of control rate. Overweight was reported less control rate 37(29.1) in comparatively with normal body weight and obese, (Table 5).

Table 5: Distribution of conditional control versus medical variable.

Sr /No	Variables	Total N	Controlled N (%)	Uncontrolled N (%)	p-value chi-square
1	Diagnosis				
	Hypertension	150	83 (55.3)	67(44.7)	0.00
	Diabetic	88	23(26.1)	65(73.9)	41.1
	Diabetic &hypertension	100	18(18.0)	82(82.0)	
2	Cor-morbidity				
	Present with DM or BP	133	55(41.4)	78(58.6)	
	Present with DM or BP with other NCD	105	51(48.6)	54(51.4)	0.00
	Present with DM and BP	44	7(15.9)	37(84.1)	22.81
	Present with DM and BP with other NDC	56	11(19.6)	45(80.4)	
3	Living with condition				
	Up to 5 years	207	80(38.6)	127(61.4)	0.243
	5 years and over	128	41(32.0)	87(68.0)	1.5
5	Availability of medicine at hospital				
	Available	175	59(33.7)	116(66.3)	0.10
	Sometime available	148	61(41.2)	87(58.8)	1.9
6	Number of drug administered				

	One medicine	135	53(39.3)	82(60.7)	0.41
	Two medicine	192	66(34.4)	126(65.6)	0.81
6	Body weight and obesity				
	Normal body weight	69	23(33.3)	46(66.7)	0.02
	Overweight	127	37(29.1)	90(70.9)	7.62
	Obese	140	63(45.0)	77(55.0)	
7	Smoking habit				
	Yes	30	11(36.7)	19(63.3)	1.00
	No	308	113(36.7)	195(63.3)	0.00
8	Consuming high fruit and vegetable				
	Yes	295	105(35.6)	190(64.4)	0.31
	No	43	19(44.2)	24(55.8)	1.19
9	Doing physical exercise				
	Yes	34	16 (47.1)	18(52.9)	0.25
	No	282	101(35.8)	181(64.2)	1.64

Hypertension and diabetes have lowered control rate than patients with both conditions. Hypertension patient 85 (56.7%) and also. Diabetic patient 21(24.4) were more under control in compared to the patients diagnosed only diabetic. While these different rates were statistically not significant (p-value= 0.19), (p-value= 0.29), (Table 6).

Table 6: The control rate among hypertension, diabetes and both condition

Diagnosis	Total	Control Hypertension N (%)	Un Control Hypertension N (%)	p-value chi-square
Hypertension	150	85 (56.7)	65(43.3)	0.19 1.80
Hypertension with Diabetes	98	47 (48)	51(52)	
Total	248	132(53.2)	116(46.7)	
Diagnosis	Total	Controlled Diabetes N (%)	Un Control Diabetes N (%)	p-value chi-square
Diabetes	86	21(24.4)	65(75.6)	

diabetes with Hypertension	95	20(21.1)	75(78.9)	0.59 0.29
Total	181	41(22.6)	140(77.3)	

4. DISCUSSION

The current study was conducted on 338 patients who were diagnosed with diabetes and/or hypertension and receiving medications in north Iraq- Kurdistan region. The study used the convinced sample technique. 150(44.1%) patients were reported to have hypertension, 88(25.9%) patients had diabetes, and moreover 100 (29.4%) patients were diagnosed with both conditions.

This study has found that hypertensive patients were more likely under control 83 (55.3%) in compared to diabetic 23(26.1%) and patient who was diagnosed with both condition 18 (18.0%). Similarly, two studies have shown that poor health related quality of life (HRQoL) among hypertensive patients 39.7 ± 1.7 was less in compare to diabetic patients 41.9 ± 1.6 and patients having both conditions showed worst health quality of life (35.1) (15,18). Another study have revealed that poor HRQoL especially physical component summary (PCS) was observed in patients who had both hypertension and diabetes mellitus Kurdistan (16). The mean SF-12 score was 39.0 ± 1.64 , mean of PCS was 36.6 ± 1.9 and mean of mental component summary (MCS) of was 41.5 ± 1.6 .

Further demographic and socioeconomic characteristics of diabetic and/or hypertensive patient have been studied in this study. Females shown to suffer more from HTN and Diabetes than males. Most of the participants have no history of significant smoking and physical exercise (p-value: 0.005) were high significantly among male group. While the mean of BMI 29.8 ± 5.2 was highly significant (p-value: 0.003) in the female group. Females were suffering the conditions in early age compared to males (female mean age: 57.3 ± 11.7 male mean age: 60.6 ± 10.6 , p-value: 0.017). Moreover, mean of age (58.35 ± 11.5) in the current study was higher in compared to south Iraq studies, 51.4 and 56.3 years (13, 6), and High BMI (29.2 ± 5.0) was observed in our study compared with south Iraqi study (28.0 ± 5.4 kg/m²) (13). A study has found that patients who were female, older, did not have a spouse and did not have jobs and/or retired were significantly and negatively associated with poor health related quality of life (16). Similarly, two studies have revealed that poor HRQoL was less observed in hypertension patients 39.7 ± 1.7 compared with diabetic patient 41.9 ± 1.6 , whereas those who diagnosed both conditions were worst 35.1 (17,18). The smoking rate decrease in the current study;

prevalence of previous smoking was 63(18.5%) while current smoking is 31 (9.1%). The prevalence of current smoking is less compared with southern Iraq studied 12- 25% (12,13).

Controlling the rate in diabetes and hypertension disease is variable in different population setting, and population characteristics may play an important role in determining the rate. In this study, patients who suffered both conditions, hypertension and diabetes, considered as a control if both conditions was controlled. In this constant, overall control rate in the current study for (HTN and/or DM) patient were 124(36.7%). The control rate in patients who diagnosed both condition (HTN&DM) 18(18.0%) were significantly (p-value: 0.00) less in comparison with hypertension 83 (55.3%) and diabetic patient 23(26.1%). The control rate of hypertensive patient in the current study was higher in compared with finding in Ugandan study (35.9%) (14).

While there is a an association between HRQoL and hypertension as well as diabetes, this study has not introduced adherence of the given population to their prescribed medication (16)

However, a study has found that HRQoL including both PCS and MCS were associated with strong adherence to medicine and their treatment outcome. The relation of HRQoL with treatment(16). In contrast , as study has found that there was not a significant relation between HRQoL and adherence to medication (15). Co- morbidity was highly significant (p-value: 0.00) associated with controlling rate. Sex, age, and duration of living with condition were not statistically associated with controlling of condition. Whereas previous studies has revealed that women patient are more likely with a high control rate (14, 19). Literacy and living with spouse was significantly associated with controlling of the condition (HPN and/or DM).

CONCLUSIONS

Some significant risk factors like high BMI and low physical activity in female patients, and smoking in male were observed. BMI and mean age were higher compared to southern Iraq. High control rate was observed in hypertension patients in compared with diabetes and those diagnosed both conditions. Insufficient control was mainly due to the presence of co-morbid diseases.

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