Factors associated with poor glycemic control in diabetic patients in Kirkuk

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Abstract

Background

Iraq's health-care system has faced tremendous obstacles in its recovery from the Islamic State's conflict. There is no public insurance system in place. Iraq has set targets to prevent and control noncommunicable diseases (NCDs) such as diabetes, but safety confrontation and governmental insecurity have made these objectives difficult to achieve. Better glycemic control is critical in allowing patients to perform at their best in terms of diabetes management and preventing long-term complications.

The goal is to identify the roadblocks to better glycemic management.

The participants in this cross-sectional study were recruited from a diabetes out-patient clinic at Baba Gurgur diabetic facility. From April to December 2019, K1 hospital – North oil company in Kirkuk city. A validated questionnaire was used to interview those with an uncontrolled glycemic index (AIC7%). Patients were asked to name the primary causes of inadequate glucose control and to select more than one response based on their opinion.

The mean A1C was 8.3 2.1 percent, with 256 (22.5 percent) patients having an A1C less than 7% and 880 (77.5 percent) having an A1C equal to or greater than 7. Poor glycemic control is caused by a lack of medication and/or a lack of drug supply from PHC in 51.1 percent of cases. Diet and medication non-compliance, as well as illiteracy, account for 35.1 percent and 19.8 percent of the population, respectively. Glycemic regulation is greatly influenced by one's financial situation. However, security issues and political instability play a significant impact.

Conclusion: Diabetic patients confirmed poor glycemic control, with the majority of cases being linked to Iraq's current health situation.

Key words: .Diabetes Mellitus, Management, Kirkuk

Background:

Iraq's health-care system has faced important challenges in its recovery from the war against Islamic State. Nearly 1.3 million people have been internally displaced, and nearly nine million are still in need of humanitarian assistance after a four-year war, with reconstruction costing at least 88 billion dollars. The displaced are unable to return to their homes due to factors such as the tardy reconstruction of homes and infrastructure, a lack of job opportunities, and the inability to access essential services. The public health system in IRQA is free of decades. In Iraq, there is no formal private health-care insurance system.[1]The Iraqi healthcare framework is essentially centric , with a certain amount of government cash allocated to it each year. Iraq had a doctor-to-patient ratio of 7.8 to 10,000 in 2011, depending on WHO . Syria, Lebanon, Jordan, and Palestine had exponentially lower rates than the surrounding countries. .[2]

Since the invasion of Iraq in 2003, the Iraqi healthcare system has been in desperate need of rebuilding. There is no public insurance system, thus they rely on the central government of Iraq to operate the public healthcare system, which has no corroboration or range in treatment options. Depending on the World Bank, government outlay on health regulation has surged in the last ten years, rising from 2.7 percent of GDP in 2003 to 8.4 percent in 2010. The disbursement of these cash, however, is still in dispute, as there are still a shortage of facilities, medication, and personnel to show for it. The Iraqi healthcare system, according to one Iraqi resident in Kirkuk who underwent spinal chord surgery, is not nearly as beneficial as foreign healthcare systems. [2]

Diabetes is becoming more common in Middle Eastern countries, as is the IRAQI. Diabetes Mellitus is a chronic condition that is increasingly spreading. T2Dm Prevalence in Iraq ranges from 8.5. (IDF-age adjusted) to 13.9 percent, according to reports .[3]

Iraq has set targets for preventing and controlling noncommunicable diseases (NCDs) such as diabetes, hypertension, and breast cancer. However, safety confrontation and governmental insecurity have made these objectives difficult to achieve. [3]

Physical inactivity, bad food, over body weight, lack of health awareness, health beliefs, stance and life style are central auxillary factors for type 2 diabetes mellitus, which is most prevailing Middle Eastern countries .[4]

To delay or prevent diabetes-related complications, glycemic control (AIC concentration of less than 7.0 percent) is difficult to achieve .[5]

There was a 21% reduction in the risk of any diabetes complication, including myocardial infarction, stroke, amputation, and microvascular problem, with every 1% reduction in the mean AIC .[6]

Diabetic patients in Iraq obtained their medications, including insulin, from a basic healthcare center that supplied all medications .[7]

However, as a result of the Islamic State's conflict and falling oil prices, IRAQ (an oil-producing country) is experiencing an economic crisis; primary care facilities and knowledge are weak, and healthcare supply is mainly reliant on secondary and tertiary care. Primary care

schedual for soon diagnosis of hypertension, diabetes, and breast cancer were designed, but they were not successful .[3]

It's critical to identify the barriers to better glycemic control so that patients can do their best to improve diabetes control and reduce long-term complications .[8]

Diabetic patients use greater resources in the ambulatory and in-patient settings than non-diabetic patients. Diabetes care should be a top focus in order to reduce morbidity and costs. [9,10]

Aim:

It's critical to identify the barriers to better glycemic control so that patients can do their best to improve diabetes control and reduce long-term complications.

Methods:

The participants in this cross-sectional study were recruited from a diabetes out-patient clinic at the Baba Gurgur diabetic facility. From April to December 2019, K1 hospital – North oil company in Kirkuk city. Their final (HbAIC) values were calculated in the central lab. Diabetic patients, whether type 1 or 2, are included in the study if they have had fully one year of continuation in the the center.

Those with an uncontrolled glycemic index (AIC7%) were interviewed using a validated questionnaire carried out by the diabetic center's medical team. The questionnaire had a total of 12 questions in which patients were asked to identify the primary cause of inadequate glycemic control and select multiple answers based on their opinion. The responses were either yes or no. Diabetes lasted anywhere from one to thirty years.

The following were the study's exclusion criteria:

Aged under the age of eighteen.

Women who are expecting a child.

Patient with diabetes for less than a year.

Patients who have been diabetic for less than a year are followed up in a diabetic center.

AIC values were not available for the patients.

Oral anti-Diabetic drugs (OAD) such as Metformin and glibenclamid, which were the only two types of oral antidiabetic drugs available to Iraqi diabetic patients from governmental primary health care centers[3], were used for our patients. Smokers were defined as anyone who had smoked in the previous three months.

Obtaining information

The investigator created a tool-specific questionnaire form with four components based on updated related literature to the study subject. Part 1: Demographic and social behavioral characteristics of the studied patients (age, sex, smoking, disease duration) and study patients schooling grade was classified into four groups: group I included those who could not read or write, group II those with low education (6 year), group III medium education (6 year education 12 year), and group IV with rise education (12 year). The financial differences between study subjects are based on the classification of study participants' occupations, which are coded from 1-3 and include: 1.government employees (regular monthly salary) as a good-income group, 2-retired employers as a middle-income group, and unemployed patients (workless) as a low-income group .[11]

Part 2: Anthropometric measurements were taken in accordance with the WHO stages guideline. A-Weight was calculated in kilograms (kg) with a precision of 0.1 kg on a WHO weighing scale. B-Height was measured with a stadiometer, and weight was recorded with a weight balance after the patient was measured barefooted and in light clothing. The height measurement, on the other hand, is taken to the nearest 0.1 cm. C-At the midpoint between the lowermost rib and the iliac crest, the waist circumference (WC) in centimeters was measured. D-Body mass index (BMI), which is determined by multiplying weight (kg) by height squared (m2).

Part 3: In the sitting position, blood pressure was delibrate with a sphygmomanometer and recorded in the right arm. Blood pressure was measured using the mean of two measures done 5 minutes apart.

Clue of Q wave myocardial infarction or left bundle branch block, echocardiographic segmental wall motion anomalies, deviating results of coronarynangiocardiography, percutaneous coronary intervention, or coronary artery bypass surgery were used to diagnose coronary artery disease. Cerebrovascular disease was diagnosed during a 24-hour period of abrupt neurologic deficit with or without neuroimaging abnormalities. Proteinuria was defined as persistent frank proteinuria in the absence of RBC or WBC in the urine.

Approval on ethical grounds:

Before starting the trial, the Baba GurGur Diabetic Center K1 hospital-Northern Oil corporation gave its official approval.

Table (1):Demographic and clinical characteristics of study participants

Variable	HA1c <7%		HA1c ≥10%)		Total	P.value
	No.256	%22.5	No.880	77.4%		
Age	55.1±11.6		52.2±12.7		53.61±11	**0.093**
Gender						
Men	**150**	**58.6%**	**432**	**49.1%**	**582 (51.2%)**	**0.0069**
Women>	**106**	**41.4%**	**448**	**50.9%**	**554 (48.8%)**	
Smoker	**35**	**13.7%**	**200**	**22.7%**	**235(20.7%)**	**-**
BMI	29.1±6.55		32.0±5.55		30.5±5.53	**0.03**
Employment						
governmental employees	**103**	**40.2%**	**259**	**29.4%**	**362(31.8%)**	
Retired employees	**62**	**24.2%**	**291**	**33.1%**	**353(31.1%)**	**0.002**
unemployed patient(workless)	**93**	**35.6%**	**330**	**37.5%**	**421(37.1%)**	
Residence						
Urban	**140**	**54.7%**	**469**	**53.3%**	**609(53.6%)**	**0.747**
Rural	**116**	**45.3%**	**411**	**46.7%**	**527(46.4%)**	
Duration of DM						
1 year	**43**	**16.8%**	**112**	**12.7%**	**155(13.6%)**	
1-5 year	**85**	**33.2%**	**288**	**32.7%**	**373(32.8%)**	**0.102**
5-10 year	**67**	**27.2%**	**293**	**33.3%**	**360(31.7%)**	
>10 year	**61**	**23.8%**	**187**	**21.3%**	**243(21.8%)**	
Education						
I. **Illiterate** (who cannot read or write)	**17**	**6.6%**	**174**	**19.8%**	**191 (16.8%)**	
II. those with low education (≤ 6 year),	**40**	**15.6%**	**332**	**37.7%**	**372(32.7%)**	**0.001**
III. medium education(6 year ≥ education≤ 12year)	**102**	**39.8%**	**198**	**22.5%**	**300 (26.4 %)**	
IV. with high education (>12 year)	**97**	**38%**	**176**	**20.0%**	**273 (24.0%)**	
Diabetes treatment						
Oral antidiabetic agent	**131**	**51.2%**	**450**	**51.1%**	**581(51.1%)**	
Insulin	**51**	**19.9%**	**115**	**13.1%**	**166(14.6)**	**0.027**
Oral plus insulin	**49**	**19.1%**	**211**	**23.9%**	**260(22.9%)**	
Not onmedical treatment or herbal treatment	**25**	**9.8%**	**104**	**11.8%**	**129(11.4)**	
Type of DM						
Type I	**30**	**11.7%**	**97**	**11.0%**	**127(11.2%)**	**0.842**
Type II	**226**	**88.3%**	**783**	**89.0%**	**1009(88.8%)**	

Results

The mean A1C was 8.3 2.1 percent, with 256 (22.5 percent) patients with an A1C of less than 7% and 880 (77.5 percent) with an A1C of equal to or greater than 7%. , Table 1:Demographic and clinical characteristics of study participants Of the 1136 patients studied, 51.2% were men and 48.8% were women, with a mean age of 53.6111 and a range of 18–90 years. Smokers made up 13.7 percent of the study sample with A1C less than 7%, 22.7 percent of the study sample with A1C equal to or more than 7%, and 191 (16.8%) of study participants were illiterate. According to ADA guideline 2022, all patients should be advised not to use cigarettes, other tobacco products, or e-cigarettes, and smoking cessation should be addressed as part of the diabetes education program. Obesity is a key diabetogenic factor. [21] To improve overall health and maintain adequate glycemic control, aim for a BMI of 25 kg/m2 [22]. The occupation of study participants was classified into three groups, coded from 1-3, including: 1- (31.8 percent) governmental employees (regular monthly salary) as a good-income group, 2- retired employee (31.1 percent) as a middle-income group, and (37.1 percent) jobless patient. .In the current study, 53.6 percent of patients came from the city, while 527 (46.4 percent) came from the countryside. Table 2 depicts the patient perception of not achieving good glycemic control among the (880) patients with A1C 7%. In 51.1 percent of cases, lack of medication and/or no drug supply from PHC, or shortage of supply and no provision of current OAD drugs, is the cause. Self-monitoring of blood glucose is extremely inadequate, with a lack of glucometers and strips available through the government health care system or strips being too expensive in the private sector accounting for 49 percent of the reasons for poor glycemic control. HbA1c is not available in PHC and is sometimes available in secondary and tertiary health care systems, and it is expensive in the private sector, according to 39% of patients. Other laboratory tests are also expensive in the private sector. Diet and medication non-compliance, Spirituality and GOD-centered locus of control, and illiteracy account for 35.1 percent, 19.2 percent, and 19.8 percent, respectively.

Table(2):Patients viewpoint about causes of poor glycemic control diabetes .

variable	HbA1c>10% n=880(75.5%)	
	No.	**%**
Illiteracy	174	19.8%
Unavailability of medication and/or no drug supply from PHC, ,or shortage of supply and no supply of modern OAD drugs	450	51.1%
Unwariness of diabetic complication	280	31.8%
reluctance to use home monitoring Self-monitoring of blood glucose ,no supply of glucometer and strips from govermental health care system or strip is expensive in private sectore	429	49%
Diabetes is untreatable disease(Not understanding the nature and consequences of diabetes)	176	20%

Needle phobia	111	12.6%
whether the patient knew what an HbA1Cand whether the patient knew what the value of the HbA,C was; HbA1c is not available in PHC and some time in secndaroy and Teriteary health care system and its expensive in private sector ,the same applies to other laboratory tests	346	39.3%
Lacks of trust in public health care system	44	5%
Spirituality and GOD concentered locus of control	169	19.2%
Migration and Access difficulties and/ or unavailability PHC	132	15%
No compliance with diet and medication	309	35.1%
Tight controls risk	166	18.9%

DISSCUTION

Because the mean A1C was 8.3 2.1 percent, we discovered with a considerable percentage of our diabetes patients had poor glycemic management. According to the recommendations, blood glucose levels that appear to correspond with accomplishment of an A1C of less than 7% (53 mmol/mol) in the current study (256) participants had an A1C of less than 7% and (880) patients had an A1C of equal to or higher than 7%. [12] According to the National Diabetes Statistics Report 2020, 50 percent of people with self-reported diabetes have A1C levels that are within the target range [13,14].

Insulin was insufficiently used by Iraqi patients; in the current study, 14.6% of patients relied solely on insulin. Over the course of six years, 53 percent of patients in the United Kingdom Prospective Diabetes Study will require the addition of insulin therapy to achieve their HbA1C target[15]. Doctors convincedthat the barriers to starting insulin treatment were primarily belong to the patients' manner and believes about the therapy. Major patient-related obstacles to insulin treatment were the influence on the patient's social life and misconceptions regarding insulin's negative effects .[16]

Type 2 diabetes mellitus (T2DM) treatment vary in height grade between Iraqi public and private sectors; this differences related to treatment access discrepancy. In the current study, 187 (21.3 percent) of participants with A1C 10 percent were suffering from Diabetes for more than 10 years, 51 percent on oral antidiabetic agent, and 19.8 percent illiterate with 37,5 percent unemployed patient(workless) with lower monthly income. Age, duration of

diagnosis, style of therapy, and degree of education all have an impact on a patient's willingness to participate in diabetes management .[17]

Spirituality and a God-centered locus of control account for 19.2%, 5%, and 12.6 percent of the reasons for uncontrolled diabetes, respectively, according to participants in the current study.Health attiudes, lifestyle, control issues, social norms, health aim, and sentimental health may as well play a function. Reluctance to use home monitoring Self-measuring of blood sugar,no supply of glucometer and strips from the governmental health care system, or strip is expensive in the private sector are issues that 39.3 percent of the study population face. The integral role of self monitoring of blood sugar in whole treatment schedule is supported by all diabetes management guidelines. People with diabetes should be provided with blood glucose monitoring devices as indicated by their circumstances, preferences, and treatment. Blood glucose monitoring must be available at all times for people who use continuous glucose monitoring devices [19]. Whether the patient knew what a HbA1 was, or what the value of the HbA1C was; HbA1c is not available in PHC and only occasionally in secondary and tertiary health care systems, and it is expensive in the private sector; the same applies to other laboratory tests, which account for 39.3 percent of the total in this study; according to ADA guidelines, achieving A1C targets of 7% has been shown to reduce microvascular complications of type 1 and type 2 diabetes [20]

PHC was blamed in 15% of our survey sample for migration and access issues and/or unavailability. There were two types of migration in Kirkuk following the war: displaced from neighboring governorates in Iraq to Kirkuk and displacement inside the city. Diabetic patients in Iraq received their drugs, including insulin, from a Primary health care that distributed throughout the country, but after the war in 2014, there was a shortage of drugs. As a result, 51.1 percent of patients blame the PHC for their uncontrolled diabetes. As a result, they purchase it from the market, which is costly in this scenario. Moreover people do not always trust government hospitals in investigations and instead rely on private laboratories, which were costly, and there is no public insurance system, which is why 39.3% of them blame the cost. [2,3]

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