

Situation Analysis of Diabetic Patients at Primary Health Care Centre in Al-Hassa, Saudi Arabia

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Abstract

The prevalence of diabetes for all age groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The problem is that it has many complications that affect multiple systems. The complications can be prevented by strictly control of sugar level. We aimed to find out the rate of uncontrolled diabetes mellitus by doing a situation analysis of file records at primary health care centre in Al-Hassa, Saudi Arabia. It was a cross-sectional study conducted during a mentorship in April to June 2013. We started our study by defining our objectives and development of protocol. After initial approval of our research question, we started to develop a spread sheet for collection of information from files available at primary health care centre. During our study, we included 104 files in total. Out of these, 65.4% were belonging to males while 34.6% files related to females. We fed data into SPSS version 22 and apply chi-square test for assessing significant difference at the level of 0.05. This data has showed that the mean of age of patients 58.521 ± 13.837 , and the mean of their BMI is 30.732 ± 7.614 . Uncontrolled diabetes means that the HbA1C is greater than 7% most of times and this can damage the heart, kidneys and nervous system. This study showed that most of the patients have high HbA1C value, High LDL-HDL ratio, and some of them have complications like retinopathy. Therefore, it seems the population have high rate of uncontrolled diabetes mellitus. It is recommended that the family physicians and the patients to be aware about the diabetes and its sever complications.

Keywords: Uncontrolled diabetes; Complications; Saudi Arabia

Introduction

The prevalence of diabetes for all age groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women [1]. The prevalence of diabetes is high among the Saudi population and represents a major clinical and public health problem. In June 2009, a cross-sectional study among 6024 patients attending a primary care at King Fahad Armed Forces Hospital has shown that diabetes mellitus was present in 1792 (30%) patients [2].

Diabetes can be defined as a lifelong (chronic) disease in which there are high levels of sugar in the blood [1]. Diabetes mellitus is not a single disease entity but rather than a group of metabolic disorders sharing the underlying feature of hyperglycemia. This hyperglycemia is result from defect in insulin secretion, insulin action or both. Classification of diabetes according to the cause could be varying widely, but the vast majority of cases fall into two board classes. These classes are type 1 and type 2. Type 1 diabetes is characterized by an absolute deficiency of insulin secretion caused by pancreatic β - cell destruction, and this usually because of autoimmune attack. Type 2 is caused by a combination of peripheral resistance to insulin action and an inadequate compensatory response of insulin secretion by the pancreatic β -ell [3]. Diabetes can be symptomatic or asymptomatic which discovered in routine test. The symptoms of the disease may include blurry vision, polydipsia, Fatigue, polyphagia, polyuria and Weight loss [4].

Uncontrolled diabetes is diabetes that is not being treated at all, or is not being adequately treated, causing blood sugar levels to rise in the patient. If allowed to persist, this condition can cause serious medical complications, eventually leading to death, usually because of cardiovascular disease or stroke. People who develop diabetes

symptoms should seek a medical evaluation so they can get treatment, and diabetes patients need regular checkups to determine if their condition is responding to treatment [5].

The main feature of this disease that it has many complications that affect multiple systems, and some of these complications: Cardiovascular diseases, Hypertension, Ketoacidosis (DKA) retinopathy, gangrene, peripheral and autonomic neuropathy, cerebral Stroke and Nephropathy [6].

Aim

To assess the rate of uncontrolled diabetes mellitus and to make the people aware about this disease, because it could be asymptomatic and to prevent it's severe complications.

Materials and Methods

Research design

In this research about uncontrolled diabetes in Al-Hassa, the researchers have been designed as cross-sectional study. The main causes for this design are: It will save time and it is faster to do, also it is with low cost, and finally it does not require any follow up because the data will be collected in short time.

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Sample Size: The population of Al-Hassa is approximately 1,063,112 people; therefore, the sample has been calculated around 500 peoples. However, it was not possible to collect all information from 500 files out of 32 primary health care centres. Thus it was decided to have convenient non-probability sample from one centre and during two days whatever the number available and easily possible to collect, we collected. The total 104 files have been explored and collected information from them [7-10].

Procedures

At the beginning, the researchers have taken an approval from King Faisal University for the study. A formal approval has been taken from Ministry of Health for collection of data from their primary health care centre. The investigators have visited primary health care centre to perform a pilot testing and thereafter modified the spread sheet.

The information that has been collected through spread sheet included file number and age. Then the researchers have collected specific information about the disease for example: Type of diabetes, co-morbidity and complications. The last thing in this data is the management such: Physical activity and drugs [11-14].

Material

The researchers calculated their material from reading some researches and literatures, after that they discussed for more than two hours about the items that will be included in the research. Finally, the researchers defined the variables that lead them to put the research questionnaire (Table 1).

Statistical analysis

The researchers have used the SPSS 17 for their data. In order to check the correctness of the data, we checked frequency tables first then did a descriptive analysis. Then researchers have done descriptive analysis and calculated the mean, median, and mode for continue data. Most of the data is categorical, so they have made Chi square test after checking normality of data. Finally, researchers have supported the research by charts and tables (Table 2).

This data result shows that the majority of our population mean of age is above 50 years for example the mean was 58.5 ± 14 year and the average height is 146 ± 49 cm. the majority of our patients diagnosed above 40 ± 13.792 the awareness among our populations is less than required. The patients mean result of HbA1C is 10 ± 11 . The LDL/HDL ratio mean result is 2 ± 1 . The mean number of drugs usage among the patients is 3.6 ± 2.3 also, the patients mean result of BMI is 31 ± 8 (Figure 1 and Table 3).

The relation between LDL-HDL Ratio and BMI classification is non-significant (P value=0.189).

Our result showed that those who have overweight also have high LDL/HDL that has confirmed the established fact that overweight people have high LDL as compared to HDL (Table 4). The relation between LDL-HDL Ratio and Physical is non-significant (P value=0.191). Our

	Week 1	Week 2	Week 3	Week 4	Week 5
Proposal writing	✓				
Data collection		✓			
Analysis			✓		
Final report				✓	
Presentation					✓

Table 1: Gantt chart.

Characteristics	Mean	Median	Standard deviation
Age	58.5	60	14
Height	146	161.5	49
Age of diagnosis	46.5	48	14
HbA1C	10	9.3	11
LDL/HDL	2	3	1
Number of Drugs	3.6	3	2.3
BMI	31	30	8

Table 2: Descriptive analysis for the basic characteristics.

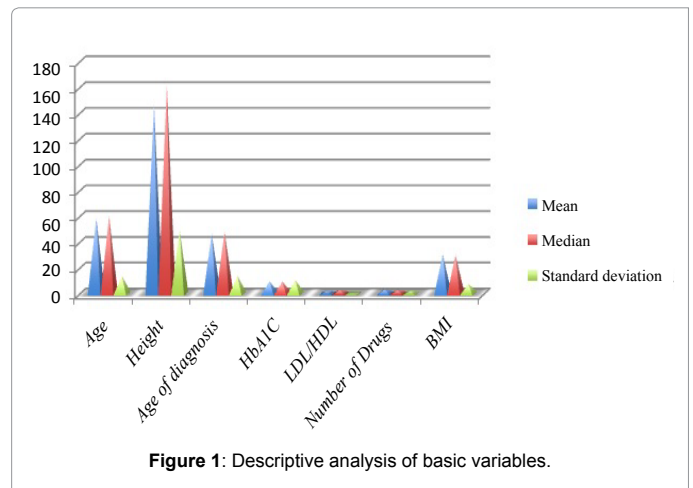


Figure 1: Descriptive analysis of basic variables.

LDL\HDL Ratio	BMI classification				
	Healthy weight	Over weight	Moderately obese	Severely obese	Very severely obese
Low	8 (24.2%)	4 (12.1%)	9 (27.3%)	5 (15.2%)	7 (21.2%)
Normal	2 (50.0%)	0	2 (50.0%)	0	0
High	12 (20.3%)	21 (35.6%)	12 (20.3%)	7 (11.9%)	7 (11.9%)

Table 3: LDL\HDL ratio and BMI classification.

LDL\HDL Ratio	Perform Physical Activity	
	Yes	No
Low	14 (41.2%)	20 (58.8%)
Normal	0	5 (100.0%)
High	22 (33.8%)	43 (66.2%)

Table 4: LDL\HDL ratio and physical activity.

result depicted that those who do not do any kind of physical activity having the highest LDL/HDL ratio (Table 5). The relation between LDL-HDL Ratio and Complications is significant (P value=0.040).

Our result indicates that those who have the highest LDL/HDL ratio are the most susceptible people to get complications (Table 6). The relation between HbA1C and BMI classification is non-significant (P value=0.156). Our result showed that those who are obese also have high HbA1C (Table 7). The relation between HbA1C and Physical activity is non-significant (P value=0.469). Our result showed that those who do not do any kind of physical activity also have high HbA1C (Table 8).

Results

The relation between Age of diagnosis classification and Complications is non-significant (P value=0.159) [15,16]. Our result showed that those who are between (43-63) years old are more susceptible to develop complications The relation between HbA1C and

Parameters	Complications						Total	
	LDL\HDL ratio	NO complication	Retinopathy	Neuropathy	Nephropathy	I.H.D		I.H.D and Retinopathy
Low		12	4	2	0	12	4	34
		35.30%	11.80%	5.90%	0.00%	35.30%	11.80%	100.00%
Normal		2	2	0	0	0	0	4
		50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	100.00%
High		39	11	1	3	8	2	64
		60.90%	17.20%	1.60%	4.70%	12.50%	3.10%	100.00%
Total		53	17	3	3	20	6	102
		52.00%	16.70%	2.90%	2.90%	19.60%	5.90%	100.00%

Table 5: LDL\HDL ratio and complications.

Parameters	BMI classification					Total	
	HbA1C classification	Healthy weight	Over weight	Moderately obese	Severely obese		Very severely obese
Normal		0	4	2	3	0	9
		0.00%	44.40%	22.20%	33.30%	0.00%	100.00%
High		6	2	6	0	3	17
		35.30%	11.80%	35.30%	0.00%	17.60%	100.00%
Higher		15	16	14	8	9	62
		24.20%	25.80%	22.60%	12.90%	14.50%	100.00%
Total		21	23	22	11	13	90
		23.30%	25.60%	24.40%	12.20%	14.40%	100.00%

Table 6: HbA1C classification and BMI classification.

Parameters	HbA1C classification	Physical Activity		
		Yes	No	Total
HbA1C classification	Normal	4	5	9
		44.40%	55.60%	100.00%
	High	5	14	19
		26.30%	73.70%	100.00%
	Higher	27	41	68
		39.70%	60.30%	100.00%
	Total	36	62	98
		36.70%	63.30%	100.00%

Table 7: HbA1C classification and physical activity.

Parameters	Complications						Total	
	HbA1C classification	NO complication	Retinopathy	Neuropathy	Nephropathy	I.H.D		I.H.D and Retinopathy
Normal		4	0	1	1	3	0	9
		44.40%	0.00%	11.10%	11.10%	33.30%	0.00%	100.00%
High		13	3	0	0	2	0	18
		72.20%	16.70%	0.00%	0.00%	11.10%	0.00%	100.00%
Higher		34	13	2	1	13	4	67
		50.70%	19.40%	3.00%	1.50%	19.40%	6.00%	100.00%
Total		52	16	3	2	19	4	96
		54.20%	16.70%	3.10%	2.10%	19.80%	4.20%	100.00%

Table 8: HbA1C classification and complications.

Complications is non-significant (P value=0.509) our result showed that those who have high HbA1C are suffering from retinopathy and IHD as the common complication between them (Table 9). The relation between HbA1C and Complications is non-significant (P value=0.469) our result showed that those who have high HbA1C don't have any physical activity (Table 10). The relation between HbA1C and Complications is non-significant (P value=0.631) our result showed that those who have high HbA1C are in the age range between 43-63 (Table 11).

Discussion

Uncontrolled diabetes means that your HbA1C is greater than 7%

most of times and this can damage the heart, kidneys and nervous system. Acute life threatening consequences of uncontrolled diabetes are hyperglycemia with ketoacidosis or non-ketoacidosis hyperosmolar syndrome. In some individuals with diabetes, adequate glycemic control can be achieved with weight reduction, exercises, and glucose lowering agent. There for do not require insulin. Individual with extensive beta-destruction and therefore no residual insulin secretion require insulin for survival. The severity of the metabolic abnormality can progress, regress or stay the same. Thus, the degree of hyperglycemia reflects the severity of the underlying metabolic process and its treatment. This data result shows that the majority of our population mean of age is above 50 years for example the mean was 58.52+13.8 year and the average

height is 146.287+48.95. Also the majority of the patients diagnosed above 40 years+13.792 the awareness among the populations are less than required. The patients mean result of HbA1C 9.624+10.6. Our study shows according to (Al-Salhia Primary Health Care Centre) that prevalence of diabetes mellitus type 2 is higher (84.6%) compared to the type 1 (14.4%). A study [1] showed that prevalence of diabetes mellitus is 23.7% in KSA. The relation between LDL-HDL Ratio and BMI classification is non-significant (P value=0.189). The result indicates that those who have overweight also have high LDL\HDL that has confirmed the established fact that overweight people have high LDL as compared to HDL. The relation between LDL-HDL Ratio and Physical is non-significant (P Value=0.191). The result depicted that those who do not do any kind of physical activity having the highest LDL\HDL ratio. The relation between LDL-HDL Ratio and complications is significant (P value=0.040). The result indicates that those who have the highest LDL\HDL ratio are the most susceptible people to get complications. The relation between HbA1C and BMI classification is non-significant (P value=0.156). The result showed that those who is obese also having high level of HbA1C. The relation between HbA1C and physical activity is non-significant (P value=0.469). The result showed that those who do not do any kind of physical activity also have high HbA1C. The relation between HbA1C and Complications is non-significant

(P value=0.509). The result showed that those who have high HbA1C are suffering from retinopathy and IHD as the common complication between them. The relation between Age of diagnosis classification and Complications is non-significant (P value=0.159). The result proved that those who have high HbA1C are in the age range between 43-63. The relation between HbA1C and Complications is non-significant (P value=0.631). The results indicate that those who have high HbA1C do not have any physical activity. The relation between HbA1C and Complications is non-significant (P value=0.469). The result showed that those who are between (43-63) years old are more susceptible to develop complications.

Limitations

The population of this research is 104 patient, time consent, because we are students and have many assignments, lectures and studying, we do not have enough time to cover that much of population. We made it in one health care center (Al-Salhiah). We discovered some of the doctors did not write the complication of diabetes and some caregivers do not cooperate with us.

Conclusion

This study showed that most of the patients has high haemoglobin A1C value, High LDL- HDL ratio and some of them have complications like retinopathy, therefore it seems we have high rate of uncontrolled diabetes mellitus.

Recommendations

A. For policy makers & public health specialists:

We need to perform some large scale study for confirmation of the results of this study.

B. For patients:

Maintaining an optimum BMI, i.e. at the lower end of the normal range

Practising an endurance activity at moderate or greater level of intensity

Achieving adequate intakes of through regular consumption of wholegrain cereals, legumes, fruits and vegetables.

C. For physicians:

Make researches and campaign in order to make the people aware about the risk of the disease.

Physicians should continue themselves to improve through continuous medical education.

Parameters		Physical Activity		
		Yes	No	Total
HbA1C classification	Normal	4	5	9
		44.40%	55.60%	100.00%
	High	5	14	19
		26.30%	73.70%	100.00%
	Higher	27	41	68
		39.70%	60.30%	100.00%
	Total	36	62	98
		36.70%	63.30%	100.00%

Table 9: HbA1C classification and physical activity.

Parameters		Age class			
		(22-42)	(43-63)	(64-88)	Total
HbA1C classification	Normal	1	3	5	9
		11.10%	33.30%	55.60%	100.00%
	High	1	11	7	19
		5.30%	57.90%	36.80%	100.00%
	Higher	14	31	22	68
		20.60%	45.60%	32.40%	100.00%
	Total	16	47	34	98
		16.30%	48.00%	34.70%	100.00%

Table 10: HbA1C classification and age.

Parameter	Complications						
	NO complication	Retinopathy	Neuropathy	Nephropathy	I.H.D	I.H.D and Retinopathy	Total
Age of diagnosis classification	4	1	1	0	0	0	6
	66.70%	16.70%	16.70%	0.00%	0.00%	0.00%	100.00%
(22-42)	17	3	1	1	9	0	31
	54.80%	9.70%	3.20%	3.20%	29.00%	0.00%	100.00%
(43-63)	25	13	1	1	9	4	53
	47.20%	24.50%	1.90%	1.90%	17.00%	7.50%	100.00%
(64-88)	3	0	0	1	2	2	8
	37.50%	0.00%	0.00%	12.50%	25.00%	25.00%	100.00%
Total	53	17	3	3	20	6	102
	52.00%	16.70%	2.90%	2.90%	19.60%	5.90%	100.00%

Table 11: Age of diagnosis classification and complications.

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