Turkish Journal of Endocrinology and Metabolism, (2005) 2 : 49-54 **ORIGINAL ARTICLE**

Glycemic and Good Target Control Among Diabetics at a University and Erfan Private Hospital

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The objective of the study is to determine and compare a good target level of blood sugar control assessed by HbA1c, blood pressure and serum LDL – cholesterol in diabetic patients attending out-patients clinics at King Abdul Aziz university, government hospital and patients attending out-patients clinics at Erfan and Bageddo private hospital in Jeddah in western province of Saudi Arabia.

This is a cross section study conducted at two month period between January 2005 and February 2005 in two centers (KAUH) and Erfan Bageddo Hospital. The data included demographic data, duration and type of DM. HbA1c, blood pressure level, serum cholesterol and LDL- cholesterol level, different types of drugs that were being used were recorded.

Two hundred patients, one hundred from each hospital were enrolled in the study. Females accounted for 70% at KAUH group versus 54 % in Erfan group. Saudi patients attending Erfan group were 62 % compared to 51 % in KAUH group. Mean HbA1c was almost the same in both groups 7.8+/-1.8 mmol/L. good and acceptable HbA1c was observed in 58 % at KAUH group versus 54 % at Erfan group. The blood pressure target control was good in both groups; however target LDL- cholesterol was scientifically better in Erfan group 1.88+/-1.2 versus 3.22+/.9 m mol/ L in KAUH group with significant p value of 0.0001. The low rate of aspirin use amongst diabetic patients was observed more in KAUH study group compared to Erfan group

Even after great efforts, a target level of HbA1c glycated hemoglobin not achieved in both groups of patients – in private and governmental hospitals. LDL- cholesterol was not achieved n governmental hospital, where as low rate of aspirin use was not achieved in both groups. Efforts are needed to improve compliance to diet and drug regimens and to identify and treat risk factors in each patient with the aim to reach target recommendations for HbA1c, blood pressure and LDL-cholesterol.

Key words: Diabetes, HbA1c, LDL- cholesterol, blood pressure, Aspirin

Introduction

Diabetes mellitus (DM) is a chronic illness that requires continuous medical care, patients self management and education to reduce the risk of long term complications (1).

It is the most common endocrine disease, although the disease is prevalent worldwide, there is significant difference in frequency among countries (2). In the Kingdom of Saudi Arabia the prevalence of disease is high reaching up to 23.7 % (3)

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The guidelines for management of DM recommend intensive control of blood sugar reaching target of HbA1c as close to physiological level as possible, preferably less than 7 %. This was associated with reduced morbidity and mortality (4). Diabetes is a coronary heart disease risk equivalent, National Cholesterol Education Program (NCEP) advise physician for intensive treatment of dyslipidemia in diabetics. It recommends levels of LDL-cholesterol to 70 mg /dl = 1.7 m mol//L, and triglycerides to <1.7 m mol/L (150 mg / dl) (5). The LIFE (6) and the ALLHAT (7) studies have demonstrated that adequate P control improve outcomes especially stroke. The hypertension Optimal treatment (HOT) study (8) and the U.K (9) prospective Diabetes Studies (UKPDS) have shown the benefits of achieving tight blood pressure control. The ADA guideline recommends

that blood pressure in diabetics should be controlled to levels lower than 130/80 mm/hg or lower if possible to less than 125 /75 mm hg (10). Angiotensin–converting enzyme (ACE) inhibitors are considered the first line antihypertensive therapy for diabetic hypertensive patients because of their well established reno-protective effects. Angiotensin Receptors Blockers (ARBs) have also been shown to reduce the rate of progression of microalbuminrea to macro-albuminuria as well as ESRF in patients with type 2 diabetes (11). The economic burden of disease is enormous. Diabetic patients should be managed by a team rather one doctor. Failure of consistency of care cause confusion among patients and reduce their compliance. The objective of this study was to determine and compare target level for blood sugar control by HbA1c, blood pressure and serum LDL – cholesterol in diabetic patients attending outpatient's clinics at King Aziz University, government hospital with patients attending clinics at Erfan and Bageddo private hospital in Jeddah in western part of Saudi Arabia.

Material and Method

This is cross section study conducted at two months period between January 2005 and February 2005. Two centers were selected in this study, one is a governmental and teaching hospital at western province of Saudi Arabia, King Abdula aziz university hospital and the other was (Ba gadeo and Erfan hospital) the famous and large private hospital in Jeddah. Two hundred patient, (one hundred patients from each hospital) who were regularly followed up in out patient clinics were randomly selected. The inclusion criteria of this study were to determine the glycemic control by measuring HbA1c. We divided the glycemic control into three groups. Those with excellent, (HbA1c >6 %), those with acceptable (HbA1c 6-8 %) and those with poor glycemic control more than 8 %).

Data collection included demographic data, duration of diabetice, type of DM (1, or type 2). The degree of control DM assessed by HbA1c level, presence of microalbuminurea, hypertension (uncontrolled hypertension was considered if blood pressure was more than 140/90 mm Hg), and hyperlipademia by (recording total (cholesterol, triglyceride and LDL level).

The data included the pattern of diabetic treatment whether diet, oral hypoglycemic drugs (type of OHD, sulphonyurea, metformine, trogloitazone, acarobose), insulin. The different type of antihypertensive medications used, angiotensin- inhibitors or angiotensin receptor blocker and other types; statins for hyperlipademia and aspirin. Data analysis was carried out using Statistical Package for Social Sciences. Mean ± SD was calculated for quantitative data, and frequency for categorical variables. Students't-Test was used.

Results

Two hundred patients who had HbA1c level tested (one hundred from King Abdulaziz University hospital and one hundred from Private Erfan Bageddo hospital) were enrolled in this study. There was no difference in the age group between the two hospitals; however females were more properandance at KAUH group 70% versus 54 % in Erfan group Saudi patients were more propandance in Erfan group 62 % versus 51 % at KAUH group. There was no statistically significant different in the duration of DM between the two groups. Most of the patients were type 11 DM, 85 % at KAUH and 91 % in Erfan group. (Table 1).

Table 1. Demographic data of governmental KAUH and private Erfan Ba geddo Hospital

Character	KAUH	Erfan & Bageddo Hospital	P value
Age	47+/-14	49.4 +/-13.7	
Sex			
Male	30	46	
Female	70	54	
M:F ratio	0.4:1	0.8:1	
Nationality			
Saudi	51	62	
Non Saudi	49	38	
S: NS ratio	1:1	1.6:1	
Systolic Blood pressure	130+/-22	128+/-12	0.563
Diastolic Blood pressure	76+/-12	82+/-8	0.011
Type of DM (1)	15	9	
Type of DM (2)	85	91	
Duration of DM	9.8+/-5	7+/-4	0.06

Good and acceptable long term glycemic control of HbA1c < 8 % were observed in 58 % at university patients versus 54 % in Erfan group. No statistically

significant difference in mean HbA1c between the two groups was seen, it was 7.8+/-1.8 in university group versus 7.8+/-1.78 with p value of 0.004. (Table 2).

Table 2. Glycemic control of two hospitals

Hebraic	KAUH	Erfan & Bageddo Hospital
< 6	24	14
6-8	34	40
>8	42	46

The mean target blood pressure was observed in both groups and there was no statistically significant difference in level of systolic and diastolic blood pressure between the two groups.

Reaching target hyperlipidemia especially LDL level was much better in Erfan group with levels of 1.88+/-1.2 versus 3.22+/.9 m mol/L with significant p value 0.0001.

Table 3. Laboratory Results of Two Hospitals :-

Lab Results	KAUH	Erfan & Bageddo Hospital	P value
HbA1c	7.8+/-1.8	7.8+/-1.78	0.004
Cholesterol	5.33+/-1.2	4.4+/-2.3	0.047
Triglyceride	2.1+/-1.5	1.3+/-1.9	0.002
LDL- C	3.22+/.9	1.88+/-1.2	0.0001
Microalbuminurea	71+/-15	29+/-32	0.324

Table (3) shows different types of medications used in the two groups. Rosiglitazone, pioglitazone, Anigotensin 11\receptors blockers, statins and aspirin were commonly prescribed in Erfan group. However insulin, ACE inhibitors (mainly captopril) were mainly prescribed in university group. Sulphonylureas and metformin were equally used in the two groups (Table 4)

Table 4. Anti-diabetic, antihypertensive, statins and aspirin used in the two hospitals

Medications	KAUH	Erfan & Bageddo Hospital
Insulin	37	27
Sulphonylureas	54	55
Metformin	46	56
Acarbose	0	7
rosiglitazone	0	13
pioglitazone	0	4
ACE inhibitors	35	16
Anigotensin 11\receptors blockers	5	25
Satatins	29	40
Aspirin	26	50

Discussion

A cross-sectional study was conducted of 200 diabetic patients attending King Abdulaziz University Hospital medical clinic and private Erfan hospital during two months period in order to determine the rate of reaching target levels of blood glucose, blood pressure and serum lipids (1).

Developing guidelines for the management of DM should be given priority, as it is a common, serious and costly health problem. Saudi Arabia with high prevalence country (23.7 %) (3). Although DM is assoicted with a high incidence of complications, better control is associated with reduced morbidity and mortality. The economic burden of disease is enormous (4).

Target HbA1c as close to physiological levels as possible, preferably less than 7% is required to delay the onset and rate of progression of complications (12,13) .Poor glycemic control with HbA1c > 8 % was reported in 42% at KAUH patients and 46 % at Erfan hospital. This could be due to poor compliance of patients regarding their diet and drug regimens.

The National Cholesterol Education Program (NCEP) advice physicians to consider new and more intensive options for patients at high and moderately high risk of hear attack. Diabetes is cardiovascular risk equivalent. These options include setting lower treatment goals for LDL cholesterol 1.7 m mol/L (>70 mg / dl) and initiating drug therapy at lower LDL threshold (5). In our study there was statistically significant target control of LDL- C in Erfan Hospital patient's 1.88+/-1.2 m mol/L versus 3.22+/.9 m mol/L at KAUH patients with P value > 0.0001. This was due to the fact that 40 % of patients in Erfan group were treated with statins, however only in 29 % of patients at KAUH. King Abdulaziz hospital which is a teaching governmental hospital, which provides health care to all social classes of patients and most of the patients are poor, who could not afford medications. Most patients visiting Erfan private hospital had a health insurance, which made prescribing statins, which are expensive drugs more easily

The benefits of tight blood pressure control in patients with diabetes exceed the benefit of tight glycemic control and extend not only to the prevention of macro vascular disease, but also the prevention of micro vascular complications. The hypertension Optimal Treatment (HOT) study (8)

and the UK (14). Prospective Diabetes Studies (UKPDS) have shown the benefits of an achieving tight blood pressure control. The LIFE (6) and the ALLHAT (7) studies have demonstrated that adequate BP control improves CVD outcomes especially stoke, when aggressive BP targets are achieved. The ADA guidelines recommend that blood pressure in diabetics should be controlled to level of 130/80 mm Hg or lower. If there is significant kidney disease, we are even looking for lower values than that if possible less than 125 /75 mm Hg (1).

Angiotensin – converting enzyme (ACE) inhibitors are considered the first line antihypertensive therapy for diabetic and hypertensive patients because of well- established renal protective effects. ACE inhibitors have shown to reduce severe CVD (myocardial infarction, stroke, and death), thus further supporting the use of these agents in patients with microalbuminuria. Angiotensin Receptors Blockers (ARBs) have also been shown to reduce the rate of progression from micro to macroalbuminuria as well ESRF in patients with type 2 diabetes (11).

In patients with type 1 diabetes, with hypertension and any degree of albuminuria, ACE inhibitors have been shown to delay the progression of nephropathy. In patients with type 2 diabetes, hypertension, and microalbuminuria, ACE inhibitors and ARBs have been shown to delay the progression to macroalbuminuria. Mean blood pressure controlled reached target guidelines in both groups; however in KAUH patients mainly used captopril which is a cheap ACE inhibitors, whereas patients in Erfan hospital used new ACE inhibitors and ARBs (Losrtar) as reno- protective agents (15,16)

People with diabetes have a two- to fourfold increase in risk of dying from the complications of cardiovascular disease. Meta-analysis of studies and large scale collaborative trials in men and women with diabetes support the view that low-dose aspirin therapy should be prescribed as a secondary prevention strategy, if no contraindications exist and as a primary prevention strategy in adults with diabetes who are at risk for cardiovascular events.

The low rate of aspirin use among people with DM was observed in KAUH study group compared to Erfan group although aspirin is a cheap drug. However it is was underused in both groups according to guidelines recommendations. This could be explained by fear of the treating physicians in prescribing aspirin therapy particularly those with hypertension and retinopathy. This underused of aspirin were also reported by the study done by Akbar etal (17).

In conclusions

Even after great efforts, it was difficult to reach target level of HbA1c glycated hemoglobin among patients whether at governmental or private hospital (18,19,20 21). Target blood pressure was achieved in both groups, however LDL–cholesterol reached target (22) levels in private hospital versus governmental Hospital because of support of heath insurance in prescribing statins (23). There was low rate of aspirin prescriptions 50% both governmental and Erfan hospital diabetic patients. Efforts are needed to improve compliance to diet and drug regimes and to identify and treat risk factors in each patient with the aim reach target guidelines recommendations for HbA1c, blood pressure and LDL- cholesterol (24,25,26,27,28,29).

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