GLYCEMIC CONTROL AMONG DIABETICS AT A UNIVERSITY AND ERFAN PRIVATE HOSPITAL

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ABSTRACT

Objective: To determine level of blood sugar control assessed by HBAIc, 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.

Methods: This is a cross sectional study conducted for two month between January 2005 and February 2005 in two centers (KAUH) and Erfan & Bageddo Hospital. It included demographic data, duration and type of DM. HBAIc, blood pressure level, serum cholesterol and LDL- cholesterol level. Different types of drugs that were being used were also recorded.

Results: 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 HbAIc was almost the same in both groups 7.8+/-1.8 mmol/L. good and acceptable HBAIc 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 statistically better in Erfan group 1.88+/-1.2 versus 3.22+/-9 mmol/ 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

Conclusion: Even after great efforts, a target level of HBAIc glycated hemoglobin was not achieved in both groups of patients – in private and governmental hospitals. LDL- cholesterol was not achieved in governmental hospital, whereas low rate of aspirin use was observed 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 HBAIc, blood pressure and LDL-cholesterol.

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

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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 Kingdome of Saudi Arabia the prevalence of disease is high reaching up to 23.7%[3].

The guidelines for management of DM recommend intensive control of blood sugar reaching target of HbAIc 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

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to <1.7 m mol/L (150 mg / dl)[5]. The LIFE [6] and the ALLHAT[7] studies have demonstrated that adequate BP control improve outcomes especially stroke. The Hypertension Optimal Treatment (HOT) study[8] and the UK Prospective Diabetes Studies[9] (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]. Angiotinsin Converting Enzyme (ACE) inhibitors are considered the first line antihypertensive therapy for diabetic hypertensive patients because of their well established reno-protective effects. Angiotensine 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 multidisciplinary 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 HBAIc, 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 and compare with target levels designated as good, satisfactory and poor.

METHODS

This is a cross sectional study conducted for two months between January 2005 and February 2005. Two centers were selected, one was a governmental teaching hospital at western province of Saudi Arabia, King Abdul Al Aziz University Hospital and the other was (Bagadeo 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 was determined by glycemic control by measuring HbAIc. We divided the glycemic control into three groups. Those with excellent, (HbAIc >6 %), those with acceptable (HbAIc 6-8 %) and those with poor glycemic control more than 8 %.).

Data included demographic details, duration of diabetes, type of DM (Type-I & Type-II). The degree of control of DM was assessed by HBAIc 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 recorded the pattern of diabetic treatment whether diet, oral hypoglycemic drugs (type of OHD, sulphonyurea, metformin, trogloitazone, acarbose) and 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 HbAIc level tested (one hundred from King Abdul Aziz 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 there was preponderance of females at KAUH group 70% versus 54 % in Erfan group. Saudi patients were more in Erfan group 62 % versus 51 % at KAUH group. There was no statistically significant difference in the duration of DM between the two groups. Most of the patients were Type-2 DM, 85 % at KAUH and 91 % in Erfan group (Table-1).

Good and acceptable long term glycemic control of HBAIc < 8 % were observed in 58 % at university patients versus 54 % in Erfan group. No statistically significant difference in mean HbAIc between the two groups was seen, 7.8+/-1.8 in university group versus 7.8+/-1.78 with p value of 0.004 (Table-2)

Table-1:- Demographic data of governmental KAUH and Private Erfan Bageddo 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 in Years	9.8+/-5	7+/-4	0.06

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.

Table-2:- Glycemic control of two hospitals

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

Table-3:- Laboratory Results of Two Hospitals:-

Lab Results	*KAUH*	*Erfan & Bageddo Hospital*	*P value*
HbAIc	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-4 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

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

prescribed in university group. Sulphonylureas and metformin were equally used in the two groups.

DISCUSSION

Target HbAIc 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 HbAIc > 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 heart attack. Diabetes is cardiovascular risk equivalent. These options include setting lower treatment goals for LDL cholesterol 1.7 mmol/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 mmol/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, as compared to 29 % of patients at KAUH. King Abdul Aziz 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 cannot

afford medications. Most patients visiting Erfan Private Hospital had a health insurance, which made prescribing expensive statins a bit easy.

The benefits of tight blood pressure control in patients with diabetes exceed the benefit of tight glycemic control. This helps not only in the prevention of macro vascular disease, but also the prevention of micro vascular complications. The Hypertension Optimal Treatment (HOT) study[8] and the UK Prospective Diabetes Studies (UKPDS) have shown the benefits of an achieving tight blood pressure control[14]. The LIFE[6] and the ALLHAT[7] studies have demonstrated that adequate BP control improves CVD outcomes especially stroke, 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 mmHg[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 control achieved target guidelines in both groups; however in KAUH patients captopril was mainly used which is an economically priced ACE inhibitors, whereas patients in Erfan Hospital used new ACE inhibitors and ARBs (Losrtan) 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 contra-indications 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 an inexpensive drug. However it was underused in both groups as per guidelines recommendations. This could be explained by fear of the treating physicians in prescribing aspirin therapy particularly to those with hypertension and retinopathy. This underuse of aspirin has also been reported by Akbar et al[17].

CONCLUSIONS

Even after great efforts, it was difficult to achieve target level of HBAIc glycated hemoglobin among patients at governmental as well as private hospital[18-21]. Target blood pressure was achieved in both groups. However LDL – cholesterol target[22] levels was achieved better in private hospital as compared to patients in government hospital because of support of health insurance in prescribing statins[23]. There was under use of aspirin among 50% of patients both at government and Erfan hospital. Efforts are needed to improve compliance to diet and drug regimens and to identify and treat risk factors in each patient with the aim of achieving target guidelines recommendations for HBAIc, blood pressure and LDL-cholesterol [24-29].

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