Diabetic Clinic Study

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ABSTRACT

The purpose of this study is to evaluate the ocular state of the population seen at the St. Mary's and Clinica Santa Maria Clinics compared to their awareness and control of their diabetic condition. This information was determined through a retrospective review of records of 199 patients seen at the St. Mary's and Clinica Santa Maria Clinics from April 2002 to December 2003. The review looked at 14 different areas which included clinic, age, gender, zip code, insurance type, last eye exam, dilation at last exam, visual correction, CPT code, duration of diabetes, HbA1c, diagnosis, recall and referral. This information allowed for evaluation of diabetic control and the ocular results of that control.

BACKGROUND

Diabetes is a disease that is rapidly becoming a major problem in the United States. According to the American Diabetic Association, 18.3 million people (6.3%) in the United State have diabetes, of which 13 million people are diagnosed and 5.2 million remain undiagnosed. (4) This number is only growing. The number of known cases of Diabetes increased about 3% annually between 1990 and 1995, but jumped to about 6% by late 1990's and 8.2% by 2001. (2) According to the Director of the Division of Diabetic Translation at the Centers for Disease Control and Prevention, Frank Vinicor M.D, within 24 hours about 2,800 people will be diagnosed with this disease. (2) The ADA estimates that there will be approximately 1.3 million newly diagnosed diabetic patients per year.(4)

It has been shown that ethnicity is a major factor for the likelihood of developing diabetes. Latinos are among the highest risk populations in the U.S.(4) On average, Hispanic/Latino Americans are 1.5 times more likely to have diabetes than non-Hispanic whites of similar age.(4) Mexican Americans, the largest Hispanic/Latino subgroup, are more than twice as likely to have diabetes as non-Hispanic whites of similar age.(2) Mexican Americans living in San Antonio have a higher prevalence of type 2 diabetes than Hispanics living in Mexico.(1) The Los Angeles Latino Eye Study found that of the patients found to have diabetes, 46% of those patients had Diabetic Retinopathy.(2)

The socioeconomic status of the Hispanic population may contribute to the increase in prevalence of diabetes in their race. Diabetes has also been found to have an inverse relationship between socioeconomic status and prevalence of obesity and type 2 diabetes in the U.S. population.(1) Another example of how socioeconomic factors may affect interethnic differences in prevalence of diabetes is related to stress. Urbanization, migration, and belonging to a minority group are associated with increased levels of stress.(1) Stress has been associated with increased risk of type 2 diabetes.

An even greater problem is the diabetic patient's lack of concern for the long-term side effects of their diabetic condition. (3) The diagnosis of this disease is only the beginning. Diabetes can cause many complications throughout the entire body. It also increases the likelihood of many other systemic diseases. The risk for stroke is 2 to 4 times higher among people with diabetes.(4) In addition, diabetes increases the risk for developing hypertension. Approximately73% of adults with diabetes has high blood pressure or is on medication to treat high blood pressure.(4) Diabetes also increases risk of kidney disease and nervous system disease. More than 60% of non-traumatic lower-limb amputations in the United States occur among people with diabetes.(4) Yet another astounding fact is that diabetes was the sixth leading cause of death listed on U.S. death certificates in 2000. Overall, the risk for death among people with diabetes is about 2 times that of people without diabetes.(4) Diabetes is also the leading cause of new cases of blindness among adults 20-74 years old. Diabetic retinopathy, the major ocular complication associated with diabetes, causes from 12,000 to 24,000 new cases of blindness each year. Despite all of the complications associated with this disease only seventy-five percent of American diabetics check their blood sugar daily, which is important for good blood sugar control.(3) Even less know their HbA1c, which is the best indicator for diabetic control.

In conclusion, diabetes is becoming a major problem that needs to be recognized and treated. People diagnosed with diabetes need to be educated on their condition and provided adequate care and guidance to prevent the many devastating complications associated with diabetes.

METHODS

Data was collected from a retrospective record review of 199 diabetic patients seen at both clinics. Two fourth year interns performed the data entry and analysis. Each record was given a numeric identification and data entered in 14 areas. The 14 areas are: clinic in which the patient was seen, age and gender of the patient, zip code where patient resides, insurance type, last eye exam, dilation at last exam, what visual correction if any, CPT code, duration of diabetes, HbA1c, diagnosis, recall and referral. Data was collected, recorded and analyzed in an Excel file.

RESULTS and DISCUSSION

Age Distribution by Decades:

Age in Years	Number in Study
10-20	6
21-30	30
31-40	40
41-50	45
51-60	45
61-70	23
71-80	8
>80	2

The majority of the patients were in the age range of 20-60, making up 80% of the total seen.

Age vs. A1C:

Age in Years	Average A1C
17-30	8.77
31-40	7.91
41-50	8.66
51-60	8.05
>60	7.53

According to the data there was no correlation between age and control of diabetes according to their A1C. An interesting finding was that on average all age groups fell above the recommended A1C level for good control.

Gender Distribution:

Gender	Number of Patients	Average A1C
Female	103	8.04
Male	96	8.61

There was a fairly equal distribution between genders seen in these clinics. On average, males had a higher A1C compared their female counterparts.

Clinic Distribution

Clinic	Number of Patients
St. Mary's	103
Clinica Santa Maria	96

The number of patients seen at each clinic was approximately the same. There was a high incidence of no shows at Clinica Santa Maria compared to St. Mary's. During the data collection period there were 16 no shows at Clinica Santa Maria and 2 at St. Mary's.

Insurance Distribution

Insurance	Number Seen
None	54
Medicare/Medicaid	60
Private	95

A striking, yet not surprising finding was that patients who had insurance appeared to be more educated about their diabetic control. Only 4 (7%) patients without insurance knew their A1C, 59 (62%) of those with private insurance knew their A1C, and 42 (70%) of those with Medicare/Medicaid knew their A1C.

Last Eye Exam

Last Exam in Years	Number of Patients	Dilated exam
Never	22	0
<1	24	13
1	40	23
1.5	8	5
2	33	15
>2	45	22
Unknown	27	3

It is well established that diabetic patients should have a dilated fundus exam at least once per year. It was found that of the 199 patients seen, 64 (32%) patients had an exam within the last year, but only 32 (18%) recall having their pupils dilated at that exam. An interesting finding was the number of patients who had never had an exam before (22 patients) and those who do not remember when their last exam was (27 patients).

Total Number of Dilated Exams:

Last Exam	Number of Patients
Dilated	81
Not Dilated	50
Unsure	46

As stated above, the majority of this population has never been dilated or is unsure, reemphasizing that these patients are not getting/seeking the recommended care for their disease.

Diabetes Type:

Type	Number
250.00 Diabetes, type II.	61
250.01 Diabetes, type I.	19
250.02 Diabetes, type II uncontrolled	59
250.03 Diabetes, type I, uncontrolled	11
250.50 Diabetes with ophthalmic manifestations, type II	8
250.51 Diabetes with ophthalmic manifestations, type I	4
250.52 Diabetes with ophthalmic manifestations, type II, uncontrolled	23
250.53 Diabetes with ophthalmic manifestations, type I, uncontrolled	11
648.03 Gestational diabetes	3

A total of 104 (52%) of the patients seen at the clinics are diagnosed as uncontrolled diabetics. Of those, 34 (32%) have ocular complications related to there diabetes. There were 80 patients diagnosed as controlled diabetics with only 12(15%) that had ocular complications. This clearly shows that the better controlled the less likely to have ocular complications.

Duration of Diabetes:

Patients that were seen at the clinics had an average duration of diabetes of 7.75 years with a range of .008 – 40 years. Twenty of these patients did not know how long they have had diabetes.

A1C:

The average HbA1c of these patients was 8.31 with a standard deviation of 1.89. The range of A1C was 4.8-14.0 with a mode of 6.7 and a median of 8.0. Out of 199 patients 93 (46 %, nearly half!!) knew their A1C and 106 patients did not know their A1C.

Ocular Complications as a result of Diabetes:

Retinopathy	Number of Patients
None	150
Non-Proliferative	41
Proliferative	3
CSME	10

The majority (75%) of these patients did not have ocular complications from their diabetes. Of those who did have complications almost all of the complications were background changes and not referred for further evaluation.

A1C and Duration Comparison:

Retinopathy	Average A1C	Range of A1C	Average Duration	Range of Duration
Without	8.26	4.8-13.1	5.77	.008-40
With	8.7	6.2-14	13.8	1-38

In general patients that had retinopathy as a result of their diabetes had a higher A1C reading than those without. The patients that did have the retinopathy also have had their diabetes over twice as long as those without diabetes.

Duration of DM in years	Average A1C
<5	7.95
6-10	8.14
11-20	8.49
>20	8.93

There was a trend in the duration of the disease with their A1C reading. The longer these patients had diabetes the higher their average A1C reading was.

Referral:

Twenty- four of the 199 patients were referred for further evaluation of their retinopathy. The average A1C of the patients that were referred out for their retinopathy was 9.32.

CONCLUSION:

With the increasing prevalence of Diabetes in the U.S. there is a great need for eye care among the diabetic patients at the St. Mary's and Clinica Santa Maria clinics. This patient population in general has poor control over their diabetes resulting in the potential for future complications secondary to the disease.

The American Diabetic Association states that diabetic patients should have a dilated fundus exam every year. The majority of the patients in this study do not receive regular dilated eye exams either due to lack of understanding their disease, lack of education on their disease, not appreciating the potential side effects or a simple lack of insurance.

People with diabetes should know their own hemoglobin A1c, and whether they are reaching their target goal. The vast majority of the patients did not know their A1C. Having a high level HbA1c is a known risk factor for developing retinopathy. In general, the patients in this study had an HbA1c higher than recommended putting them at a higher risk of developing retinopathy. Another risk factor for developing complications in diabetes is the duration of the disease. The longer the patient has diabetes, the higher is their risk for developing retinopathy. Due to the alarming increase in younger adults being diagnosed with type 2 diabetes it is essential that clinics like St. Mary's and Clinica

Santa Maria establish care for these patients early on to help prevent early blindness and even death. Overall, these patients for one of the above reasons are not receiving the proper care they need making the St. Mary's and Clinica Santa Maria an important resource for this patient population.

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