Identification of Population Characteristics Through Implementation of the Comprehensive Diabetic Retinopathy Program

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Background

- Diabetic retinopathy (DR) is the most common complication of diabetes mellitus[1] and is the leading cause of blindness in working-age adults in the world.[2]
- Longer duration of diabetes mellitus, poorer glycemic control as measured by hemoglobin A1c (A1c), and higher blood pressures are associated with increased incidence and prevalence of DR.[3-7]
- Aggressive control of both blood glucose and blood pressure significantly reduces the risk for development and progression of DR.[8-10]
- Despite the clear importance of parameters such as A1c, blood pressure, and duration of diabetes in the prevention and treatment of DR, many ophthalmologists are often unaware of patients' overall diabetes management status.

Purpose

- We propose that obtaining comprehensive data on diabetic patients will allow ophthalmologists to better risk stratify and tailor patient care.
- We implemented a program to collect data on diabetic patients presenting to the Kellogg Eye Center retina clinic and retrospectively reviewed the data to report characteristics.

Methods

- Demographics, body-mass index (BMI), blood pressure (BP), A1c, smoking history, diabetes type, DR diagnosis, diabetes duration, number of retina clinic visits, and kidney disease history based on both self-report and microalbuminuria (≥ 30 µg albumin/mg creatinine) were collected on all diabetic patients presenting to the Kellogg Eye Center retina clinic for both new patient visits and return visits from 7/1/16 to 12/30/17.
- A subgroup of patients with 2 or more of the following factors, determined "high risk" for complications by endocrinologists, was targeted for additional data collection and analysis: A1c> 9% in the last 6 months, BP> 140/90 in the last 6 months, history of kidney disease, and diabetes duration> 10 years.
- Technicians trained in diabetes education administered a three-question multiple choice survey to patients in this subgroup from 7/1/16 to 7/1/17 to assess knowledge of diabetes management goals.

Results

Table 1. Characteristics of Patients with Diabetes Presenting to a Retina Clinic

	Entire cohort N=2916				Subsample: risk score≧2 N=1014			
	N or Mean	*% or SD*	*Min*	*Max*	*N or Mean*	*% or SD*	*Min*	*Max*
Patient age Mean (SD)	64.05	14.29	13	99	62.79	13.89	17	98
Race N(%)								
Asian	134	4.60			39	3.85		
Black, African American	431	14.78			198	19.53		
White or Caucasian	2171	74.45			715	70.51		
Unknown/other/mixed	180	6.17			62	6.11		
Sex N(%)								
Female	1365	46.81			467	46.06		
Male	1551	53.19			547	53.94		
Ever smoked N (%)								
Yes	1287	44.14			415	40.93		
No/unknown	1629	55.86			599	59.07		
Diabetic retinopathy N (%)								
Yes	1664	57.06			806	79.49		
No	1252	42.94			208	20.51		
Diabetes type N(%)								
Type 1	356	12.21			143	14.10		
Type 2	1883	64.57			736	72.58		
Undefined	677	23.22			135	13.31		
Max microalbumin N(%)								
<30	239	8.20			96	9.47		
≧30	186	6.38			159	15.68		
Unknown	2491	85.43			759	74.85		
History of kidney diagnosis N (%)								
Yes	509	17.46			436	43.00		
No/unknown	2407	82.54			578	57.00		
Duration of diabetes ≧10 years								
Yes	1404	48.15			885	87.28		
No	1512	51.85			129	12.72		
Max patient's BMI Mean (SD)	33.46	7.96	17	81	34.02	8.39	17	81
Max systolic blood pressure Mean (SD)	141.91	22.86	80	237	152.71	22.7	87	237
Max diastolic blood pressure Mean (SD)	73.73	11.53	40	123	77.19	11.83	42	118
Max HbA_{1c} Mean (SD)	8.01	1.80	4.30	15.70	8.68	2.01	4.70	15.70
Patient's number of visits Mean (SD)	3.91	3.70	1	27	4.85	4.11	1	25

Table 2. Diabetes Management Goals Survey

	Within the Subsample: risk score ≧ 2 n=418 (patients who answered)	
Survey Questions and Responses	***n***	***%***
HbA1c goal:		
<7.0 (correct)	366	87.56
7.0-9.0	32	7.66
>9.0	0	0.00
No recommendation	3	0.72
No/unclear answer	17	4.07
Blood Pressure goal:		
<140/90 (correct)	192	45.93
<120/80	201	48.09
<160/100	8	1.91
No recommendation	2	0.48
No/unclear answer	15	3.59

Conclusions

- Implementation of this program allowed the creation of a longitudinal dataset on diabetic patients presenting to a retina clinic.
- Despite low mean A1c and number of visits, the large range of A1c values (4.3%-15.7%) and number of visits over 1.5 years (1-27) suggest that significant health resources are being devoted to a small number of patients.
- 87.56% of subgroup patients know their A1c goals, suggesting that knowledge of care goals is not a primary cause for poor control of their diabetes.
- Further data collection and analysis will lead to better understanding of which diabetic patients are most at risk for vision loss, and how to best address their needs.

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