Characteristics of People with Diabetic Retinopathy: Opportunities for Intervention

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Overview

• Diabetic Retinopathy (DR)
• Study objective
• Design & Methods
• Results
Diabetic Retinopathy (DR)

- DR is a disease that occurs in people with diabetes and is caused by microangiopathy.
- Leading cause of blindness among adults 25 – 74 years of age.
- Persons with DR are 29 times more likely to be blind than non-diabetic persons.
Diabetic Retinopathy (DR)

• 5.3 million Americans have DR, 52,000 AR have DR (Source: PBA report)

• Occurs in approximately 40% of people with diabetes (Kempen et al. Arch. Ophthal.)

• Vision threatening retinopathy – 8% of people with diabetes.

• $500 million annually
Diabetic Retinopathy

- Stages of diabetic retinopathy:
  - Mild Nonproliferative
  - Moderate Nonproliferative
  - Severe Nonproliferative
  - Proliferative
Diabetic Retinopathy

Early identification of those ‘at risk’
&
treatment could prevent progression and serious vision loss
Diabetic Retinopathy

• Diabetes Control and Complications Trial (DCCT) demonstrated that:

- Persons with IDDM with no DR at baseline with intensive insulin treatment had a 60% risk reduction in progression of DR compared with persons with conventional insulin treatment.

- Persons with DR at baseline, intensive insulin treatment was associated with a 54% reduction in progression, a 47% reduction in the incidence of proliferative retinopathy, and a 54% reduction in laser treatment compared with conventional insulin treatment.
Diabetic Retinopathy

- Clinical trials have shown the efficacy of treatment:
  - Panretinal photocoagulation could reduce the incidence of serious loss of vision in persons with severe proliferative retinopathy by about 50%.
  - Focal photocoagulation could reduce the loss of visual acuity from 20/20 to 20/40 by 50%.
Who are ‘at risk’?

- All people with diabetes (Type I & II)
- Duration of diabetes
- Metabolic control
- Hypertension / Hyperlipidemia
- Renal disease
- Smoking
- Pregnancy
What is known from the literature?

• Wisconsin Epidemiologic study of DR. (Insulin use, Small body mass)

• Katusic et al. (BMI < 25 – 40.8% DR, BMI 26-29.9 – 63.4% DR, BMI > 30 – 63.6% DR, P < 0.05)

• Wong et al. (DR is associated with greater waist-hip ratio)

• EURODIAB study. (DR associated with incident CVD)

• Giuffre et al. (duration and type of antidiabetic treatment, duration of alcohol intake)

• Rema et al. (DR was associated with carotid IMT & AI)

• Rema et al. (DR was associated with proteinuria (p=0.002))
Study Objective

• To assess the characteristics (demographic and disease-specific) of people with diabetic retinopathy using Arkansas behavioral risk factor survey data 2000-2004.
Study design

- BRFSS – Cross sectional study
- 2000-2004 data
- Diabetes module & Demographics section
BRFSS survey questions

• Diabetes question: Have you ever been told by a doctor that you have diabetes?

• DR question: Has a doctor ever told you that diabetes has affected your eyes or that you had retinopathy?
Sample size

- Number of people surveyed through the BRFSS survey (2000-04) – 18,112
- Number of people with Diabetes - 1480
- Number of people with DR - 331
Variables of Interest

- **Outcome variable** – Diabetic retinopathy

- **Covariates** – Demographic (age, sex, race, duration of diabetes, BMI, income, education, current smoker) & Disease-specific (insulin use, anti-DM pill use, daily blood glucose monitoring, daily foot examination, professional foot examination, foot ulcers, A1c tests, course to manage diabetes) characteristics.
Analysis

- Univariate analysis - Frequency
- Bivariate analysis - $\chi^2$ test
- Multivariate logistic regression – Stepwise and Backward elimination method used.
- Assessed for confounding and effect modification
Results

• Diabetes Prevalence (BRFSS 00-04) – 7.23%

• Among people with diabetes, 23.35% had diabetic retinopathy.
Findings from unadjusted bivariate analysis:

• Significantly higher proportion (p=0.0009) of blacks (31.94%) had DR compared to whites (20.94%)

• People with diabetes for over 10 years (36.11%) had significantly higher DR compared to those with < 5 years (14.43%) (p<0.0001)

• Similarly people who monitored their blood glucose daily (28.27%), used insulin (43.90%), had a professional foot examination (28.34%), have chronic foot ulcers (41.97%), and took a course to manage diabetes (27.71%) had significantly higher DR (P<0.005)
Salient findings

After adjusting for the covariates:

• Males (OR=1.60, 95% CI 1.16, 2.19)
• Blacks (OR=1.95, 95% CI 1.27, 3.00)
• People with diabetes for more than 10 years (OR=2.36, 95% CI 1.61, 3.47)
• People on insulin treatment (OR=2.72, 95% CI 1.91, 3.88)
• People with diabetes who have foot sores (OR=2.17, 95% CI 1.46, 3.22)

were more likely to have been diagnosed with diabetic retinopathy.
Study limitations

• Cause-and-effect: Cross sectional study
• Self-reported data
• Only those diagnosed were counted as cases (DM or DR)
Implications

• A better understanding of the characteristics of people with diabetic retinopathy may help us in early identification of those ‘at risk’ and promote preventive care measures.

• Fostering the preventive services and collaboration between eye care providers and podiatrists will assist in identifying people with DR early, and to prevent vision-threatening complications.

• Further, exploring the clinical course of DR and foot ulcers will help us with a better understanding of these frequently encountered complications among diabetics.