Eye Examination

Satisfying A Quality Care Measure in Diabetes

Doctor of Nursing Practice Project Presented to the
Faculty of Graduate Studies
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for the Degree of Doctor of Nursing Practice
by

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Eye Exam in Diabetes

Diabetic retinopathy (DR) is a leading cause of blindness worldwide.

Projection for the future:
- 200 million people by the year 2030 will have DR

(National Academies of Sciences, Engineering, and Medicine, 2017)

Impact on the quality of life (Hendrick, Gibson, & Kulshreshtha, 2015)
- impaired mobility
- risk of falls
- affects mental health and cognition,
- weakens employment and educational achievements
Eye Exam as a Quality Care Measure in DM

Importance of eye exam in diabetes mellitus (DM)
- for the provider: allows a way to better manage patients with DM
- lowers visual impairment in patients

Visual impairment due to DR:
- occurs with higher glycosylated hemoglobin (HbA1c)
- a HbA1c value below 7.0% is optimal for good eyesight
  [American Diabetes Association, (ADA) 2018]
Approval Process

Site for study

CITI training certificate for research

DNP Committee approval

IRB approval-Exempt

UMSL Graduate School
Purpose of the Study

AIM:
• To meet the Quality Care Measure (QCM) of an annual eye exam criteria in DM management (ADA, 2018)

Outcome Measures:
• A documented annual eye examination for every patient with DM.
• Level of HbA1c levels in each patient with DM.
A private family practice in St. Louis

-over 200 patients with DM seen annually
-evidence based practice guidelines incorporated in disease management
-participates in QI for improvement in patient outcome
Evidence Based Guidelines

All patients with DM are recommended:

• HbA1c biannually to meet QCM (ADA, 2018)

• An annual eye examination to meet the QCM
PICOT

In a private family practice, among adults aged 18-90 years with DM,

- what was the range of HbA1c level from June 1, 2017-March 31, 2018?
- what was the rate of documented eye examinations from June 1, 2017-March 31, 2018?
- what was the difference in the HbA1c values between the ages, races, and genders in the available data?
- what was there a difference in the rate of completion of eye exams between the ages, races and genders in the available data?
Review of the Literature

Search Engines used: Medline, EBSCO, CINAHL, PubMed, Google Scholar

31 articles were chosen for content with inclusion criteria:
  • patients with DM, ages 18-90
  • Ophthalmic manifestations
  • Studies in glucose control

Exclusion criteria: articles greater than seven years old
Facts from Current Literature

- Routine eye examination detect microvascular deterioration in patients with DM (ADA, 2018).

- Referrals for eye examination are encouraged in DM to avoid progressive vision loss (ADA, 2018).

- The presence of DR in individuals with poor glycemic control was evident with 11-15 years of DM. In patients with DM greater than 15 years, the OR increased to 9.01 (95% CI, 3.58–22.66). In patients diagnosed with diabetic nephropathy, the chance for DR was highest (OR 3.32 and a 95% CI 1.62–6.79) (Lima, Cavalieri, Lima, Nazario, & Lima, 2016).

- Ophthalmology referrals at the onset of DM is preferred to allow early detection and treatment with laser photocoagulation to retain optical capability (Evans, Michelessi, & Virgili, 2014).
Framework Used for Optimum Patient Outcome
Design

An observational and a descriptive study design

Data collection: Within a retrospective medical record review

• This was the first cycle of the Plan Do Study Act for QI
  Plan a change or test of how something works.
  Do: Carry out the plan.
  Study: Look at the results.
  Act: decide what actions to take to improve (Mayer, Oliphant, & Atanelov, 2013)

  Observation of the range of HbA1c levels of all patients with DM
  • Occurrences of eye examinations were verified

Sample: Patients with DM seen during the study period

• Inclusion criteria were patients aged 18 years-90 years with DM within the practice
• Exclusion criteria were patients who were pregnant
Data Collection

- **Retrospective medical record review: period June 01, 2017 through March 31, 2018**
- Patients with a diagnosis of DM seen during the period
- Demographics included: age, gender, race, date of HbA1c, results HbA1c levels
- Documentation of eye examination (available/not available)
- Date of eye examination completed
Process

• Descriptive and inferential statistics used for results

• Software: Microsoft Excel 2016 and Intellectus Statistics.

• Data analysis included:
  • Descriptive statistics
  • control chart
  • $t$-test for a single sample mean between the mean HbA1c and the recommended HbA1c <7%,
  • $t$-test between male and female HbA1c values
  • Chi-square for comparison of eye exam completion
Results

Figure 1. HbA1C level of control by age group
HbA1C levels of control ADA (2018) in percentage Good (<6.5) Fair (6.5-8) Poor (>8)
Results

Level of control by Race/Ethnicity

Figure 2. HbA1C level of control by race/ethnicity
Classified Level of Control per ADA (2018) in percentage Good (<6.5) Fair (6.5-8) Poor (>8)
Results

Figure 3. HbA1C level with upper limit and lower limit, mean HbA1c 7.41%
## Analysis of Eye Examination Data

Table 1

*Count of eye exams by race/ethnicity*

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>N</th>
<th>Y</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>65</td>
<td>24</td>
<td>89</td>
</tr>
<tr>
<td>African American</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Caucasian</td>
<td>16</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>39</td>
<td>129</td>
</tr>
</tbody>
</table>
Summary and Discussion

N=129   male (n=93)   female (n=36)

Results:

• 100% adherence in documentation of HbA1c results

• overall HbA1c mean of 7.41%

• HbA1c<7.0%  (51%, n=66)

• HbA1c >7.0%   (49%, n=63)

• Only 30%  (n=39) patients had documented eye examination
Implications for Practice

Discussed Questions

Why is there a delay in getting eye examination done?

- Missing documentation
- Patients not getting examination done

Additional problems identified

- Need reduction in HbA1c values for 49% of patients (desired value <7.0%)
- No established flow sheet
  - for HbA1c
  - for eye exam completion
Conclusion

Next PDSA cycle:

Implement an eye exam referral form or a consult template

Patient reminders for eye exams by phone, text, or email

Documentation form for tracking HbA1c levels

Education for lowering HbA1c levels for patients
Questions
References


