SCREENING FOR CHRONIC KIDNEY DISEASE IN PATIENTS WITH TYPE 2 DIABETES IN FAMILY MEDICINE PRACTICES – A LONGITUDINAL STUDY

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Abstract

Context: About 50% of patients with diabetes develop signs of kidney damage in their lifetime which has significant implications in terms of morbidity and mortality. Canadian Diabetes Association clinical practice guidelines recommend screening for diabetic nephropathy as early detection and intervention can delay or prevent loss of renal function and progression to end stage renal disease

Objective: To further knowledge of screening for chronic kidney disease in patients with type 2 diabetes in a subset of family medicine practices in South Western Ontario.

Design: Retrospective longitudinal data analysis of a pre-existing database of a number of primary care practices.

Participants: Patients with Type 2 diabetes from 18 family medicine practices.

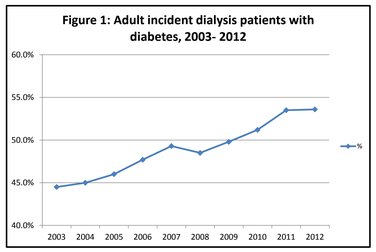
Outcome measures: To determine if there is Canadian Diabetes Association (CDA) guideline compliant screening for chronic kidney disease in patients with diabetes. We explore relation to patient age, gender, hypertension and urban versus rural practice.

Results: Out of 2399 patients that met study criteria, 144 were screened for chronic kidney disease with both urine albumin to creatinine ratio (ACR) and eGFR completed within the first year of diagnosis. Holding other variables constant patients with increasing age were more likely to be screened using both urine ACR and eGFR. An abnormal ACR or eGFR test was 1.6 times more likely to be repeated in male patients and 1.4 times more likely to be repeated by urban physicians. Out of these 144 patients, only 69 had guideline compliant care as defined by CDA including adequate repeat testing for abnormal results.

Conclusion: Overall rates of following the screening pathway as per Canadian Diabetes Association recommendations were very low as outlined. Also our study noted decreased compliance as the number of steps for screening increased including follow up of abnormal results. Further studies are required to assess additional physician, patient and system factors that affect guideline compliance and to improve the screening pathway for feasibility of screening.

Background and rationale

Figure 1: Adult incident dialysis patients with diabetes, 2003- 2012



The leading cause of chronic kidney disease (CKD) in Canada is diabetes (1). Thirty eight percent incident cases of end stage renal disease were attributed to diabetes in the Canadian organ replacement register annual report for the year 2012 (1, 2). The number of Canadians with diabetes who require dialysis or kidney transplant has also been increasing as highlighted in figure 1 (2)

Canadian Diabetes Association (CDA) guidelines recommend that screening for chronic kidney disease needs to be initiated within 5 years after diagnosis of Type 1 diabetes and at the time of diagnosis for Type 2 diabetes and continued annually thereafter (3-5). The CDA guidelines also recommend repeating an abnormal urine ACR result to avoid false positives due to transient causes of microalbuminuria and to repeat eGFR if reduced to confirm persistent reduction as it might be reduced due to transient causes including dehydration.

In a recent multicenter retrospective study in US, looking at the records of over nine thousand adults with type 2 diabetes from 466 practices, urine ACR screening was not performed in about 53% individuals and eGFR screening was not performed in 15% individuals. Chronic kidney disease was under-diagnosed in this study population as 54.1% patients had chronic kidney disease identified by the blood draw for the study, but only about 12.1% were previously identified as such by their primary care providers prior to the study (6).

Multiple studies have also identified the barriers which prevent adherence to recommended practice guidelines as outlined in table 1 (7-11).

Table 1: Factors influencing guideline adherence

Guideline Factors	Physician Factors	System Factors	Patient Factors
• Quality of evidence supporting the guidelines • Bias/Conflict of interest • Simplicity and feasibility of implementation	• Lack of knowledge • Lack of time • Attitudes and beliefs • Lack of treatment intensification (inertia from habits and routine) • Lack of outcome expectancy	• Remuneration • System support: Workspace/tools and technology/organizational characteristics • Patient load/workload per physician	• Attitude and beliefs • Lack of adherence to recommendations • Feasibility of completing required investigations/follow –up or treatment plan

Objectives

- To further knowledge of screening for chronic kidney disease in patients with type 2 diabetes in a subset of family medicine practices in South Western Ontario.
- To assess if there is there CDA guideline compliant screening for chronic kidney disease in patients with diabetes.
- To explore relation to patient age, gender, hypertension and urban versus rural practice.

Methodology

Retrospective data analysis of patients from 18 primary care practices in Southwestern Ontario.

3.1.1 Inclusion criteria

- All patients identified with diabetes who are 18 years of age and over
- Patients with a new diagnosis of diabetes as defined in the CPSSN database.

3.1.2 Exclusion criteria

- Patients who were first diagnosed with diabetes after December 31st 2014 to allow for a one year follow up period.
- Gestational diabetes
- Patients whose lab results could not be interpreted (for example non-numerical data).

Analysis was performed using SPSS software. Chi-square test and multiple logistic regression test were performed for analysis.

Results

Demographics: There were 2399 patients that were included in the analysis. The mean age of the patient population was 62.3 years with a minimum age of 18 and a maximum age of 98. There were 76.1% patients in urban family medicine practice. In the total sample 1133 patients were female (47.2%) and 1266 patients were male (52.8%). The majority of patients (62.5%) did not have a diagnosis of hypertension.

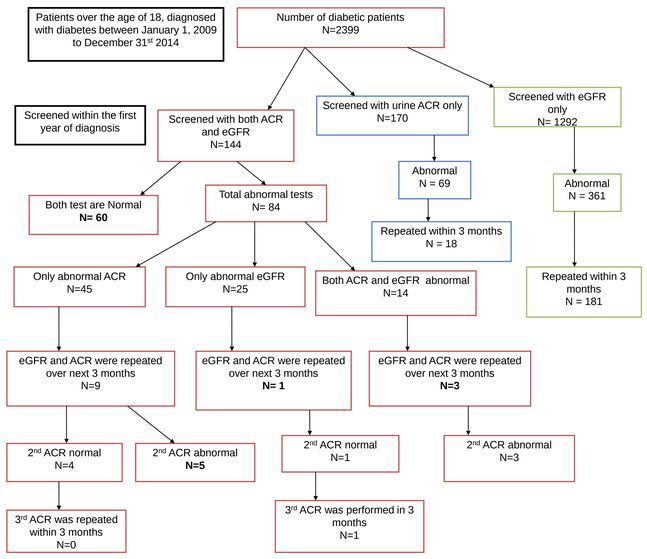


Figure 2 :Screening

Abnormal will be defined as ACR >2 for males but less than 20 and over 2.8 for females but less than 28 (2009-2013) and over 2 for both males and females but less than 20 (2014 – 2015).

Results

As shown in Figure 2, patients with type 2 diabetes were not optimally screened for chronic kidney disease. Out of 2399 patients that met study criteria, 7% were screened for CKD alone with urine ACR and 54% were screened with eGFR alone. Only 144 (6%) patients were screened for chronic kidney disease with both urine ACR and eGFR completed within the first year of diagnosis. Holding other variables constant patients with increasing age were more 1.02 times more likely to be screened using both urine ACR and eGFR. Rural physicians were more likely to screen with both urine ACR and eGFR. Repeat testing to confirm an abnormal result over a 3 month period was also suboptimal. An abnormal ACR or eGFR test was 1.6 times more likely to be repeated in male patients and 1.4 times more likely to be repeated by urban physicians. Out of these 144 patients, only 69 had guideline compliant care as defined by CDA which includes 60 patients who had normal results not requiring follow up and only 9 had appropriate follow up for abnormal results.

Conclusions

- There is a significant gap between recommended practice guidelines and actual clinical practice in screening for chronic kidney disease in diabetes.
- Decreased compliance with screening pathway was noted as the number of steps for screening increased including follow up of abnormal results.
- Patients with increasing age and in rural practices were more likely to be screened with both eGFR and urine ACR but urban physicians were more likely to repeat an abnormal test to rule out a false positive result.
- Further studies are required to assess physician, patient and system factors that affect guideline compliance and to improve feasibility of screening.

Strengths of the study: Screening data is collected from electronic medical records rather than self reported surveys from physicians or patients decreasing recall bias. The screening data is followed longitudinally to assess the compliance to individual steps in the recommended screening pathway and allows assessing how well abnormal tests are followed.

Limitations of the study: Lower screening rates could be due to factors other than those studied including frequency of patient visits and follow up on recommendations. Other patient factors can include ability to complete the test within the recommended time frame. Our study is also limited by database associated factors. The current study includes practices which use different EMR software programs (Accuro, Oscar and Nightingale). Patients may have had a lab test that we were unable to interpret due to the data quality. CPSSN data does not distinguish between type 1 and type 2 diabetes. Despite setting age of diagnosis to 18, we may have included some patients with Type 1 diabetes in our analysis.

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