



Screening for Microalbuminuria and Use of Reno-protective Agents among Type 2 Diabetic Patients from James Bay Cree Communities



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Rationale

Type 2 diabetes is highly prevalent and rising in incidence in Canadian native populations. The age-adjusted prevalence of diabetes in Native persons has been calculated at 3.6 to 5 times that in the Canadian population as a whole.¹ Because First Nations people develop type 2 diabetes at an earlier age,² and are more likely to progress to end-stage renal disease,³ diabetic nephropathy is a problem of critical importance for Native communities and their health care providers.

Diabetic renal disease exists on a spectrum from microalbuminuria with normal renal function, to overt nephropathy, with macroalbuminuria, decline in GFR and progression to end-stage renal disease. Screening for microalbuminuria permits detection of incipient diabetic nephropathy, and provides an opportunity for early intervention. Current guidelines from the Canadian Diabetes Association recommend screening all patients with type-2 diabetes at diagnosis and yearly thereafter. CDA guidelines also reflect the proven effectiveness of several modalities in reducing proteinuria and slowing progression of renal disease. They thus recommend tight glycemic control, normalization of blood pressure, and the use of ACE inhibitors or ARBs in all patients with incipient or overt diabetic nephropathy.⁴

Implementation of screening and treatment guidelines poses special challenges in Canada's First Nation communities. Geographical remoteness, and limited availability and high turnover of health care staff pose logistical problems. The degree to which patient factors also affect the ability to provide reno-protective interventions is currently unclear. Overcoming these challenges will be critical in limiting the impact of renal disease in this rapidly growing population of patients with diabetes.

References

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- Wilson R et al. Incidence and Prevalence of End-stage Renal Disease among Ontario's James Bay Cree. Canadian Journal of Public Health. 1992; 83 (2): 143-6.
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Objectives

- to determine the prevalence of screening for diabetic nephropathy in the James Bay Cree
- to identify factors that predicted screening
- to determine the prevalence of use reno-protective agents

Study Design

The study is a retrospective chart review examining the prevalence of screening for diabetic nephropathy & adherence to current therapeutic guidelines in the James Bay Cree population with type 2 diabetes mellitus.

Study Population

Patients with type 2 diabetes mellitus from six James Bay Cree communities were identified through the diabetes registry. Patients with type 1 diabetes, glucose intolerance, and gestational diabetes were excluded.

Methods

Outcomes:

- presence of an albumin-creatinine ratio or 24 hour urine for microalbuminuria within a one-year period
- Reno-protective interventions: Ace inhibitors, ARBs, statins

Exposures:

Age, sex, co-morbidity calculated from a modified Chronic Disease Score using pharmacy data, and number of medical visits

Results

Table 1. Patient Characteristics (n=738)

Characteristics	Mean/Proportion (SD)
Demographics	
Age (years)	51(14.0)
Gender (male)	0.61
BMI	35.5(7.1)
Height (cm)	164 (10)
Weight (kg)	97 (20)
Duration of disease	8.3 (5.8)
Current smoker	0.51
Chronic Disease Score	5.6 (1.9)
Biochemistry	
Serum Creatinine (µmol/L)	74 (61)
Proteinuria (g/day)	1.2 (2.4)
LDL (mmol/L)	2.6 (0.7)
HbA1C	7.8 (1.9)
Blood pressure (mmHg)	
Systolic	131 (17)
Diastolic	77 (10)
Other (n=389)	
Medical Visits (per year)	2.3 (4.4)

Table 2. Testing of traditional risk factors

	percent
Screening (one-year period)	
Microalbuminuria	86%
Blood pressure	94%
HbA1C	
Lipids	51%
	87%
Reno-protective drugs (one-year period)	
ACE inhibitors	50%
ARBs	15%
Statins	39%

Table 3. Bivariate Analysis (n=389)

Variable	Not Screened Mean/Proportion (SD)	Screened Mean/Proportion (SD)
Patient Demographics		
Age*	48 (15)	51 (14)
Male:Sex	0.53	0.62
Weight (kg)	100 (22)	97 (19)
Height (cm)	166 (9)	165 (10)
BMI	36 (7.1)	35 (7.1)
Co-Morbidity		
Duration of diabetes (yrs)	7.8 (6.0)	8.4 (5.8)
CDS*	7.9 (3.6)	5.8 (1.8)
Systolic BP	148 (22)	131 (17)
Diastolic BP*	83 (11)	77 (10)
Reno-protective Drugs		
ACE inhibitors*	41%	52%
ARBs *	7%	17%
Statins*	29%	40%
Medical Visits		
Total visits*	3.5 (4.4)	6.7 (7.3)

* p <0.05

Table 4. Multivariate Analysis (n = 403)

Variable	Odds Ratio	95% CI	p value
Age	1.001	0.98-1.02	0.95
Male sex	0.828	0.46-1.49	0.53
CDS*	1.243	1.04-1.48	0.01
Diastolic blood pressure	0.977	0.95-1.01	0.13
Medical Visits*	1.107	1.01-1.21	0.02

* p <0.05

Conclusions

Overall rates of screening are respectable (86% for microalbuminuria, 94% for BP, 51% HbA1C, 87% Lipids)

Patients who have less co-morbidity (lower CDS), and less frequent medical follow-up are less likely to be screened.

Though these patients may be at lower risk than those with greater co-morbidity, they are at higher risk than the general population. This group should be targeted for screening and risk-factor management.

The rate of use of reno-protective agents was only 50% for ACE-Is, 15% for ARBs, and 39% for statins. Further study will focus on whether physician or patient-related factors are responsible for these low rates of intervention.