Evaluation of statin use and prescribing in chronic kidney disease patients not receiving treatment with kidney transplantation or dialysis (STAT-CKD)

Mazen Sharaf, B.Sc.(Pharm); Hilary Wu, B.Sc.(Pharm), ACPR, Pharm.D.; Karen Shalansky, Pharm.D., FCSHP; Nadia Zalunardo, B.Sc., MD, SM, FRCP(C)

Background

- Chronic kidney disease (CKD) is an independent risk factor for the development of cardiovascular disease (CVD)
- Both the Kidney Disease Improving Global Outcomes 2013 and Canadian Cardiovascular Society 2016 guidelines recommend statin therapy for primary prevention of CVD in CKD patients aged ≥ 50 years who are not receiving treatment with kidney transplantation or dialysis (hereafter referred to as "statin-eligible" patients)
- At the Vancouver General Hospital Kidney Care Clinic (VGH KCC), it has been observed that nephrologists infrequently prescribe statins but may suggest initiation by family physicians

Objectives

Primary

- Among statin-eligible patients enrolled in the VGH KCC:
  - Determine the proportion of patients who are currently receiving statin therapy
  - Compare the odds of statin use when indicated for secondary vs. primary prevention

Secondary

- Among VGH KCC nephrologists:
  - Describe statin prescribing practices for primary prevention
  - Evaluate opinions on proposed strategies to improve rates of statin prescribing in statin-eligible patients enrolled in the KCC

Methods

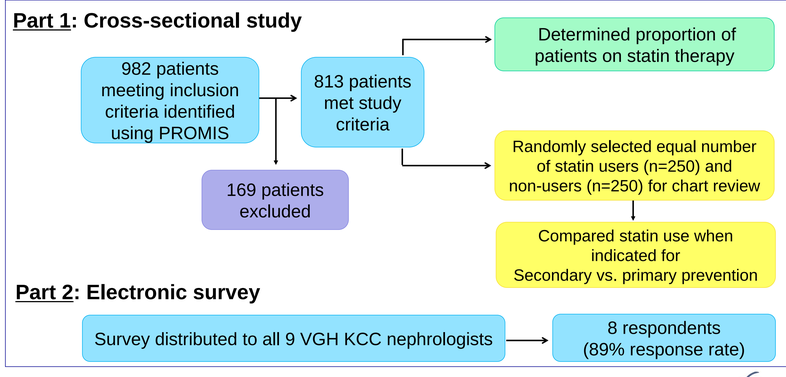
Part 1: Cross-sectional study with chart review of randomly selected patients using PROMIS database

- Inclusion criteria:
  - Patients ≥ 50 years of age enrolled in the VGH KCC with estimated
  - Estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73 m^2, and/or albumin-to-creatinine ratio (ACR) > 3.0 mg/mmol
- Exclusion criteria:
  - Documented statin allergy
  - Not yet seen by a nephrologist while enrolled in the VGH KCC
- Analysis: Descriptive statistics; Student's t-test for continuous variables; Chi-square test for categorical variables; multivariate logistic regression analysis to estimate odds ratio (OR) of statin use when indicated for secondary vs. primary prevention

Part 2: Electronic survey of VGH KCC nephrologists using UBC Survey Tool

- 14-question online survey distributed to all VGH KCC nephrologists via email
- Survey remained open for 1 month and 3 weekly email reminders were sent

Figure 1: Study flow diagram



Results

Figure 2: Proportion of statin-eligible patients on statin therapy

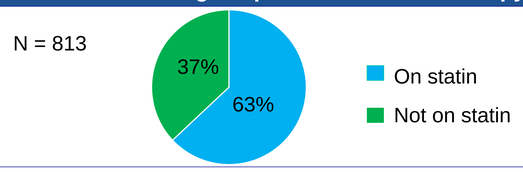


Table 1: Demographics of patients selected for chart review

	Statin Users (n=250)	Statin Non-Users (n=250)	p-value
Age (years), mean (SD)	77 (8)	75 (10)	0.048
Male, n (%)	155 (62%)	136 (54%)	0.103
Ethnicity, n (%)			0.004
Caucasian	109 (44%)	146 (58%)	
Asian	117 (47%)	85 (34%)	
Other	24 (9%)	18 (8%)	
Body mass index (kg/m^2), mean (SD)	28.1 (6.2)	26.5 (5.3)	0.002
eGFR (mL/min/1.73 m^2), mean (SD)	26 (10)	25 (10)	0.177
ACR (mg/mmol), mean (SD)	100.0 (133.0)	95.2 (125.0)	0.708
Kidney replacement therapy plan, n (%)			0.251
Conservative care	27 (11%)	42 (17%)	
Hemodialysis	25 (10%)	27 (11%)	
Peritoneal dialysis	20 (8%)	18 (7%)	
Undecided	178 (71%)	163 (65%)	
Current smoker, n (%)	7 (3%)	10 (4%)	0.625
Comorbidities, n (%)			
Hypertension	233 (93%)	213 (85%)	0.006
Diabetes mellitus	159 (64%)	71 (28%)	< 0.001
Dyslipidemia	136 (54%)	50 (20%)	< 0.001
Coronary artery disease*	87 (35%)	16 (6%)	< 0.001
Ischemic cerebrovascular disease*	33 (13%)	22 (9%)	0.153
Peripheral artery disease*	12 (5%)	8 (3%)	0.494
Abdominal aortic aneurysm*	7 (3%)	3 (1%)	0.338

* Secondary prevention indication

Table 2: Multivariate logistic regression model to estimate odds ratio of statin use when indicated for secondary vs. primary prevention (N=500)

Variable	Adjusted OR	95% CI
Age (years)	1.04	1.01 – 1.07
Sex		
Female (reference)	—	—
Male	1.26	0.85 – 1.89
Ethnicity		
Caucasian (reference)	—	—
Asian	2.46	1.66 – 3.96
Other	1.72	0.84 – 3.57
Body mass index (kg/m^2)	1.07	1.04 – 1.11
Kidney replacement therapy plan		
Conservative care (reference)	—	—
Hemodialysis	2.44	1.03 – 5.84
Peritoneal dialysis	5.07	1.96 – 13.43
Undecided	2.86	1.50 – 5.56
Statin indication		
Primary prevention (reference)	—	—
Secondary prevention	4.64	2.94 – 7.47

Survey Results

Figure 4: Nephrologists' self-reported statin prescribing practices for primary prevention (N=8)

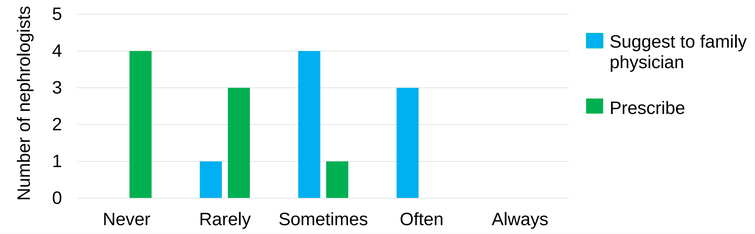


Figure 5: Nephrologists' reasons for not prescribing statins for primary prevention (N=8)

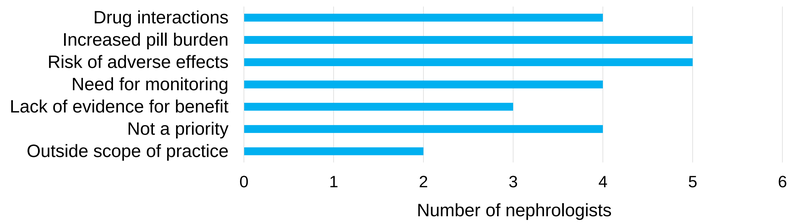


Table 3: Nephrologists' opinions on proposed strategies to improve statin prescribing rates for primary prevention in KCC patients (N=8)

Proposed strategies	Number of nephrologists who believe strategy would be beneficial
Education for family physicians about statins in CKD	5
Pre-printed order with statin options and dosing recommendations	3
Pre-printed laboratory requisition for patients initiating statins	3
Protocol for KCC pharmacist to counsel patients initiating statins	3
Educational material for CKD patients about statins	3
Increased KCC appointment duration	1
Reminder on KCC patient assessment sheets	1
Education for nephrologists about statins in CKD	1
Education for KCC allied staff about statins in CKD	1

Limitations

Part 1: Cross-sectional study

- Single-center
- Unable to determine whether statin was originally prescribed for primary or secondary prevention
- Possibly inaccurate or incomplete data in patient charts

Part 2: Electronic survey

- Limited to VGH KCC nephrologists

Conclusions

- 63% of statin-eligible VGH KCC patients are currently on statin therapy
- Statin-eligible patients are more likely to be on a statin if they have an indication for secondary prevention of CVD
- Most VGH KCC nephrologists do not prescribe statins for primary prevention
- Next steps will be to:
  - Implement KCC statin protocols
  - Educate family physicians about statin use for primary prevention in CKD
  - Create educational material for CKD patients about statins

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