DICE Study Backgrounder

Diabetes In Canada Evaluation (DICE), the largest diabetes study of its kind in Canada, examines the management and control of type 2 diabetes in the Canadian family practice setting. This chart audit study was conducted from September 2002 to February 2003. The study was conducted by Ipsos Reid Healthcare and led by Dr. Stewart Harris, Associate Professor, Schulich School of Medicine & Dentistry, The University of Western Ontario, and Dr. Jean-Marie Ekoé, Endocrinologist, Professor of Medicine and Endocrinology, CHUM Hôtel-Dieu, Université de Montréal. The results are published under the lead title "Glycemic control and morbidity in the Canadian primary care setting (results of the diabetes in Canada evaluation study)" in the October issue of ***Diabetes Research and Clinical Practice***.[i]

OBJECTIVES

- Provide insight into the care and treatment of type 2 diabetes and outline current management and treatment patterns for the disease in the Canadian primary care setting.
- Demonstrate the current level of blood sugar control among Canadian patients with type 2 diabetes.
- Provide an overview of the conditions associated with type 2 diabetes.
- Provide a benchmark from which to measure future actions designed to improve care in this disease area.

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CONCLUSIONS

The study authors concluded that[ii]:

- Type 2 diabetes is a complex disease with a high burden of complications, all of which family physicians are having to manage in their daily practice.
- Current practices are not aggressive enough to manage a substantial proportion of type 2 diabetes patients.
- Family physicians have an excellent awareness of guideline targets and recognize the need for action; however, the move to more aggressive treatment is lagging. 'Clinical inertia' may explain why knowledge is not translating into more aggressive treatment plans.
- *The Canadian Diabetes Association 2003 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada* (CPGs) are timely and may provide direction to help bridge the gap between knowledge and action. Family physicians will need help implementing these more aggressive treatment strategies.

METHODOLOGY

- Patient chart audit: 243 family physicians contributed 2,473 records for patients with type 2 diabetes.
- Physicians completed a two-page chart audit/patient record for the first 10 patients with type 2 diabetes visiting their office, regardless of the reason for the visit.
- Records included questions about glycemic test results, medication management, concurrent conditions, plans for treatment and barriers to achieving glycemic targets.
- With a sample of 2,473 patients, the results are considered accurate to within ±2.0 percentage points, or 19 times out of 20, of what they would have been had the entire Canadian type 2 diabetic population been polled. The margin of error will be larger within sub-groupings of the patient population.

KEY FINDINGS

GLYCEMIC CONTROL

The DICE study shows that one in two Canadians with type 2 diabetes does not have their blood sugar under control. Control is worse the longer patients have diabetes.

Blood sugar control is a key component of diabetes management. According to the CPGs most people with diabetes should strive for an A1C of seven per cent or lower. If achieved safely, an A1C of six per cent or less (the normal range) should be attempted.*[iii]

- Nearly half (49 per cent) of patients were not at target blood sugar levels (A1C ≤ 7 per cent).
  - ~ Almost one-third (32 per cent) of patients achieved sub-optimal levels (A1C ≤ 7 per cent to 8.4 per cent).
  - ~ Seventeen per cent of patients had inadequate blood sugar levels (A1C above 8.4 per cent).
- Study findings suggest that the longer a person has diabetes, the more likely they are to be poorly controlled.
  - Thirty-one per cent of patients who had type 2 diabetes for two years or less had A1C levels at or above 7.0 per cent.
  - Among people who have had diabetes for 15 years or more this number is 62 per cent.
- Mean A1C for all patients was 7.3 per cent.

PREVALENCE OF COMPLICATIONS

The DICE study demonstrates that the majority of patients experience health conditions associated with the disease. The prevalence of co-morbidities and complications are higher the longer a person has had the disease.

Type 2 diabetes can lead to serious and often deadly complications. In fact, diabetes is a leading cause of death by disease, with up to 80 per cent of deaths caused by cardiovascular disease.[iv]

- On average, patients are diagnosed with 2.5 complications or co-morbidities.
  - ~ Sixty-three per cent of type 2 diabetes patients had a diagnosis of high blood pressure.
  - ~ Fifty-nine per cent had a diagnosis of high cholesterol.
  - ~ Thirty-eight per cent were diagnosed with microvascular complications**, such as cataracts, foot disease or neuropathy.
  - ~ Twenty-eight per cent of patients were diagnosed with macrovascular complications***, such as heart attack, stroke or stable angina.
- The prevalence of these complications was considerable even in the newly diagnosed, and increased dramatically with the duration of the disease.

DISEASE MANAGEMENT

The DICE study suggests that physicians need to get patient blood sugar levels to target as quickly as possible after diagnosis to reduce the risk of serious and deadly complications. This will require more intensive and aggressive treatment.

Traditionally diabetes treatment has followed a "stepwise approach" to control blood sugar. This approach moves gradually from lifestyle modification to the addition of medication, which is slowly increased to its maximum effectiveness before a second medication is added.[v] *The shortcoming is it can take up to 16 months for patients to move to a more intensive therapy*[vi]*. Following the publication of the landmark United Kingdom Prospective Diabetes Study (UKPDS)*[vii]*, which demonstrated that intensive blood sugar control with a combination of oral medications was more effective at reducing the risk of serious diabetes-related complications, CPGs were revised to call for earlier and more aggressive treatment.*[viii]

- The DICE study results indicated that intensive treatment plans were considered for only half (56 per cent) of people not at target.
- More than 50 per cent of the total group was either managed by lifestyle alone or by taking no or only one oral anti-diabetic medication.
- Reflecting adherence to the "stepwise approach," patients who have had type 2 diabetes longer are more likely to be taking multiple medications than newly diagnosed patients:
  - ~ Among patients who have had type 2 diabetes for two years or less, one-third are not on any medication, 48 per cent are taking one oral medication and 18 per cent are taking two or more oral anti-diabetic medications and/or insulin.
  - ~ In contrast, patients who have had type 2 diabetes for 15 years or more, only 4 per cent are not on drug therapy, 17 per cent are taking one oral medication and 79 per cent are taking two or more oral anti-diabetic medications and/or insulin

BARRIERS TO ACHIEVING TREATMENT TARGETS

The DICE study results suggest there is a gap between knowledge and practice.

Overall, family physicians are knowledgeable of CPGs targets and recognize the need for adopting more aggressive treatment for poorly controlled patients. However, many physicians continue to rely on lifestyle modification to achieve treatment targets. Physicians were also concerned about patient compliance.[ix]

- When asked about their treatment plans for patients not at target, physicians identify lifestyle intervention as their plan for 79 per cent of patients.
- Patient non-compliance with diet (72 per cent) and exercise (71 per cent) were the principle barriers identified by family physicians to achieving optimal control.
- Patient lack of interest (37 per cent) and knowledge (21 per cent) were stated to a lesser degree, while co-morbid conditions were considered a barrier to achieving targets for one-third of patients (35 per cent).

- Other barriers include non-compliance with glucose monitoring (35 per cent), non-compliance with medication regime (24 per cent), multiple medications (16 per cent), cultural barriers (14 per cent) and drug coverage (13 per cent).

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* Glycosylated Hemoglobin (A1C) is a measure of an average blood glucose level over the past two to three months.

** Includes microalbuminuria, cataracts, neuropathy, diabetic retinopathy, nephropathy, diabetic foot disease, prior amputation.

*** Includes stable angina, myocardial infarction, congestive heart failure, prior stroke, peripheral vascular disease, left ventricular hypertrophy.

Notes to Editors:

1. DICE was sponsored by an unrestricted educational grant from GlaxoSmithKline Inc.

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[i] S.B. Harris, J. Ékoé, Y. Zdanowicz, S. Webster-Bogaert. Glycemic control and morbidity in the Canadian primary care setting. (Results of the Diabetes In Canada Evaluation Study). *Diabetes Research and Clinical Practice*. 2005;70(1):90-97

[ii] *Ibid.*

[iii] Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2003 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes* 2003;27(Suppl 2): S1-S152

[iv] Canadian Diabetes Association. "The Prevalence and Cost of Diabetes." Available at: www.diabetes.ca/Section_About/prevalence.asp.

[v] Meltzer S., Leiter L, *et al.* 1998 Clinical practice guidelines for the management of diabetes in Canada. *CMAJ* 1998;159(8 Suppl):S1-S29.

[vi] S.B. Harris, J. Ékoé, Y. Zdanowicz, S. Webster-Bogaert. Glycemic control and morbidity in the Canadian primary care setting. (Results of the Diabetes In Canada Evaluation Study). *Diabetes Research and Clinical Practice*. 2005;70(1):90-97

[vii] UK Prospective Diabetes Study Group. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. BMJ 2000;321:405-412

[viii] Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2003 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes* 2003;27(Suppl 2): S1-S152

[ix] S.B. Harris, J. Ékoé, Y. Zdanowicz, S. Webster-Bogaert. Glycemic control and morbidity in the Canadian primary care setting. (Results of the Diabetes In Canada Evaluation Study). *Diabetes Research and Clinical Practice*. 2005;70(1):90-97