



Type-2 Diabetes: One of Three Leading Causes of Death Among BC Women

Diabetes is becoming a health crisis in British Columbia. An estimated 7.1% of the province's population will be diagnosed with diabetes (primarily type-2 diabetes) by the year 2010¹. Because up to one third of people with the disease are unaware they have it, the actual percentage of British Columbians with diabetes will probably be even higher. Care and management is costly: in 2004, the province spent \$760 million on services for people with this chronic disease². The most alarming news is that diabetes has increased by 105% in BC women compared to 45% in BC men in the past decade³. A 2007 report on life expectancy in the province highlighted how three often-related conditions—diabetes, heart disease, and respiratory diseases—have dramatic consequences for women⁴. Through a gender-based analysis of women's diabetes and obesity in BC, a recent report called *Type 2 Diabetes and Women's Health in British Columbia: An Evidence Review* identified sex- and gender-based risks, and some of women's unique experiences with the condition's presentation, diagnosis, management, and outcomes. Based on this information, the report also offers a number of better practices where action should be considered.

A review of the medical literature reveals that diabetes and cardiovascular disease lead to significantly higher risks of both mortality and morbidity for women. While there are three types of diabetes that affect women (type 1, type 2, and gestational), type 2 has increased in prevalence. And although the rates of being overweight or obese are higher among BC men than women, the risk of diabetes associated with being overweight is greater in women. Between overweight women and men of equivalent body mass index, women face a fourfold greater relative risk of developing the disease⁵. Women also face greater risks for secondary complications of

diabetes, such as blindness, insulin-related cancers, and neuropathy⁶. In 60% of cases, type-2 diabetes can be delayed or prevented with clinical and/or social interventions⁷, but sex- and gender-appropriate interventions have yet to be evaluated. The diagnosis of gestational diabetes is one opportunity to offer women interventions post-partum to prevent future development of type-2 diabetes - an opportunity that is not being used to its full extent.

Causes and Risk Factors

The causes and risk factors for diabetes in women interact in complex ways. For example, women are at greater risk than men when it comes to metabolic syndrome—a spectrum of factors like glucose intolerance, hypertension, and abdominal obesity that increase one's risk of developing diabetes. In fact, compared to men who have the equivalent height and body mass, women seem to have an increased likelihood of developing these conditions. Metabolic syndrome and its high rates of diabetes correlate with low socioeconomic status. Addressing issues of poverty that have an impact on lifestyle decisions regarding diet and exercise are critical to influencing the progression of this disease in the population.

Who Is Most at Risk?

Aboriginal Women and Women of Other Ethnicities

Aboriginal women and women of Hispanic, South Asian, Asian and African descent appear to be at an increased risk for developing type-2 diabetes. It is likely that inequities associated with poverty, ethnicity, and age result in additional challenges for women in navigating the health care system. Aboriginal women are five times more likely to develop type-2 diabetes and, once diagnosed, five times more likely to die prematurely compared to other Canadians⁸.

1 Tuomilehto, J., J. Lindstrom, J. G. Eriksson, T. T. Valle, H. Hamalainen, P. Ilanne-Parikka, S. Keinänen Kiukaanniemi, M. Laakso, A. Louheranta, M. Rastas, V. Salminen, M. Uusitupa, S. Aunola, Z. Cepaitis, V. Moltchanov, M. Hakumaki, M. Manninen, V. Martikala and J. Sundvall (2001). Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine* 344(18): 1343-1350.

2 Auditor General of British Columbia (2004). *2004/2005 Report 3: Preventing and managing diabetes in British Columbia*. Prepared for the Legislative Assembly of British Columbia. <http://bcauditor.com/AuditorGeneral.htm>

3 Statistics Canada. (2007). *Persons with Diabetes by Sex, Province, and Territory*. Retrieved February 12, 2008, from: <http://www40.statcan.ca/0101/cst01/health54a.htm>

4 Provincial Health Services Authority. (2007). *Life Expectancy as a Measure of Population Health: Comparing British Columbia with Other Olympic and Paralympic Winter Games Host Jurisdictions*. <www.phsa.ca/PopulationHealth>. The evidence reviews on women's respiratory health and women's heart health are also available at this location.

5 CPHI. (2004). Cited in PHSA (2007) *Type-2 Diabetes and Women's Health in British Columbia: An Evidence Review*. <www.phsa.ca/PopulationHealth>

6 Lipscombe, L. L., P. J. Goodwin, B. Zinman, J. R. McLaughlin and J. E. Hux. (2006). Increased prevalence of prior breast cancer in women with newly diagnosed diabetes. *Breast Cancer Research and Treatment* 98(3): 303-309; Bentley-Lewis, R., K. Koruda and E. W. Seely. (2007). The metabolic syndrome in women. *Nature Clinical Practice Endocrinology & Metabolism* 3(10): 696-704.

7 Tuomilehto et al. (2001).

8 Mao, Y., B. W. Moloughney, R. M. Semeniw and H. I. Morrison. (1992). Indian Reserve and Registered Indian Mortality in Canada. *Canadian Journal of Public Health-Revue Canadienne De Sante Publique* 83(5): 350-353.

Girls and Adolescents

Girls who are overweight or obese have a higher risk of developing diabetes and face more severe diabetes-related complications than their male peers. Physical activity in childhood dramatically reduces the lifetime risk of developing type-2 diabetes but the numbers of Canadian children who are physically active, especially girls, has been steadily in decline. At one time, the age of onset for type-2 diabetes was 50 or older. Currently increasing numbers of children, adolescents, and young adults with the disease is emerging as a serious public health issue.

Women with Mental Illness

Depression is more common in women than men with diabetes and is a risk factor for not adhering to self-care (e.g., foot exams, monitoring glucose, etc.). Depression and diabetes form a circular logic: mental health disorders can increase the risk for type-2 diabetes and diabetes can increase the risk of mental illness. There is a need for more data on the relationship between mental illness and diabetes in women.

Women who are Pregnant

Trends toward earlier age of onset of diabetes have resulted in an increased number of women affected by diabetes during pregnancy. Further emphasizing the need to promote healthy pregnancy is research showing children exposed in utero to diabetes are predisposed to obesity and type-2 diabetes in later life.

Maturing Women

As people with diabetes age, they are at greater risk for organ damage, cardiovascular disease, as well as vascular dementia. It is still unclear why women are at greater risk than men for these problems, but because women tend to live longer than men do, the health care system will have to meet the needs of aging women who have these health issues.

Gaps in Our Knowledge

A lack of sex- and gender-based approaches, limited sex-disaggregated surveillance data on population health, and considerable gaps in the scientific literature limit our current knowledge about diabetes in women. In particular, there is an evident need for provincial information regarding diabetes-associated factors in Aboriginal women, women of South Asian, Asian, and Hispanic descent, lower-income women, girls and teens, as well as diabetes care in pregnancy. Increased knowledge is crucial in order to develop, implement, and meaningfully evaluate effective interventions.

Considerations for Action

Diabetes is a disease with significant morbidity and mortality for women and is also a costly burden on the health care system, with more than \$2 million per day spent in BC (in 2004) on services for persons with diabetes. Broad-based population-level interventions have not been evaluated and gender-specific care guidelines have yet to be developed, but the following actions, based on what we do know, are proposed to curtail the progression of this disease in women in our province:

- 1. Education and prevention:** Women and their care providers need to understand the seriousness of diabetes for women – particularly type-2 diabetes as well as the marker that gestational diabetes presents for future type-2 disease. Communication campaigns should be accessible to women of all ages, ethnicities, and socioeconomic status in order to be successful.
- 2. Increased research:** Data classification by sex and diabetes type, and incorporating appropriate indicators of social factors/context in future assessments of diabetes in the province would go a long way towards addressing knowledge gaps. We also need to understand more about the mechanisms by which real and perceived factors modify the risk for diabetes in all women.
- 3. Better practices and guidelines:** Early intervention programs and targeted screening sensitive to women's needs could prevent or delay onset in many of those at risk for diabetes. Development of gender- and sex-specific diabetes guidelines for care, including recommendations for broad-based follow-up of women with gestational diabetes might also be beneficial.
- 4. Sex, gender, and diversity in provincial strategies:** Primary prevention aims at controlling modifiable risks and environmental factors (e.g., diet, exercise), secondary programs target identified at-risk populations, and tertiary strategies involve women who already have diabetes. Developing strategies at these three levels that are gender- and diversity-specific may reduce incidence of diabetes in women.
- 5. Sub-populations at risk:** For populations at risk, we need to better understand living arrangements, economic sufficiency, barriers to access and use of care, health knowledge and behaviours, and overall health and well-being.

We also need creative interventions to remedy gender inequities. Targeting the social and economic sources of chronic diseases like diabetes would be more effective than aiming behavioural change at the individual, but such large-scale interventions require collaboration between multiple levels and sectors of government and key stakeholders. Given the human and fiscal costs of the disease, there are significant opportunities to be found in such collaborations.