DIABETES MELLITUS IN THE FIRST NATIONS POPULATION OF BRITISH COLUMBIA, CANADA
Part 3. Prevalence of diagnosed cases

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ABSTRACT

Objectives: To describe the prevalence of diabetes mellitus in the on-reserve Status Indian population of British Columbia based on a survey conducted in 1997 and to compare these rates with previous surveys carried out in 1987, 1992 and 1995. ***Study Design:*** Survey questionnaires were distributed to health centres, health stations and nursing stations providing health services to the 198 First Nations reserves in British Columbia. ***Results:*** Data were received from 82 of 198 First Nations communities(41%) representing 24,407(45%)of the on-reserve population of the province(53,893). A total of 636 cases of diabetes were identified. Seventy-seven percent of cases were age 35 plus. The overall prevalence in 1997 was 2.6% for all ages combined, more than doubled from 1.2% in 1987. First Nation's men and women 35 and older when compared to the general population by indirect age-standardization experienced a higher prevalence ratio-males 1.27, 95% CI 1.22,1.40 and females 2.53, 95% CI: 2.77,2.58. Among those with diabetes for >20 years, 62.5% used insulin compared to 13% who had the disease <five years(622/636 reporting). Diabetic complications were reported in 48% of individuals. Diagnosed gestational diabetes was 28/1000 live births. ***Conclusions:*** General preventive initiatives must continue including Screening, nutrition and fitness education, and improved diabetic management directed at reduction in complications. (*Int J Circumpolar Health 2002; 61: 260-264)*

Key words: Diabetes mellitus (MeSH); Indians, North American (MeSH); Prevalence (MeSH); Cross-sectional studies (MeSH)

This paper reports on the fourth in a series of surveys carried out to assess the prevalence of diabetes mellitus among First Nations people in the province of British Columbia, Canada. The results of surveys in 1987, 1992, and 1995 have been reported previously (1).

It is recognized that Aboriginal people worldwide have a higher frequency of diabetes than non Aboriginal people. Improving surveillance methods are providing a startling estimate of the vast scope of the epidemic (2). In Canada,

surveillance efforts have provided clear evidence that First Nations suffer from significantly higher frequency of diabetes.

Results from the Aboriginal Peoples Survey conducted by Statistics Canada in 1991 indicate that age standardized prevalence of diabetes among First Nations was almost three times the Canadian average. Diabetes prevalences among Aboriginal people were highest in Ontario, Manitoba, and Saskatchewan (8.2%), and relatively lower in British Columbia, Alberta, and the North (4.3%). The Aboriginal Peoples' Survey also indicated that First Nations people with diabetes experience more complications (3).

High prevalences of gestational diabetes mellitus have been reported in the First Nations population of Saskatchewan (7.5%), Quebec (14.6%) and Nova Scotia/Newfoundland (7.9%) (4). Gestational diabetes has been linked with the development of type 2 diabetes later in life in both mother and child.

METHODS

The First Nations and Inuit Health Branch of Health Canada distributed survey questionnaires to community health workers at its own on-reserve health centres, health stations and nursing stations, to on-reserve health facilities operated by First Nations organizations under Health Transfer agreements, and to communities receiving public health services from provincial or municipal health agencies. The information gathered is intended to be representative of Status Indian persons with diabetes living on reserves in British Columbia. Health workers were asked for the number of known diabetic persons in the community and each diabetic person's age, gender, estimated length of illness, diabetic therapy and diabetic complications (if any). Complications were divided by type into four categories: vision impaired/loss of sight, neuropathy (i.e. reduced sense of feeling in extremities or amputation), kidney failure/kidney infection, and heart disease/high cholesterol.

As well, the questionnaire asked for the number of births in the community over a five year period and the number of women with gestational diabetes.

The data gathered from completed surveys were collected, analysed, and reported by one of the authors (SJ).

RESULTS

In response to the survey, data were received from 82 of 198 First Nations communities in British Columbia (41%). The total on-reserve population of the responding communities was 24,407, representing 45% of the on-reserve population of the province (53,893 persons). A total of 636 cases of diabetes were identified.

The vast majority (95%) of reported First Nations people with diabetes were older than 35 years. Diagnosis of diabetes had occurred after age 35 years in 77% of cases.

The prevalence of diabetes for all ages and among those aged 35 and above is shown in Table I. In general, the prevalence is higher in the south than in the north, and higher among women than men.

The overall prevalence in 1997 was 2.6% for all ages combined. Compared to the results of surveys in 1987, 1992, and 1995 (1), the prevalence of diabetes continues to increase, and has more than doubled in the last 10 years (from 1.2 % in 1987).

We performed indirect age-standardization, with the general population of British Columbia as standard, based on the 1996/97 National Population Health Survey. First Nation men aged 35+ experienced 30% higher prevalence of diabetes (standardized prevalence ratio 1.27; 95% CI: 1.22, 1.40). For women aged 35 and above, the standard-

Table I. Diabetes prevalence (%) in the on-reserve First Nation population of British Columbia, 1997.

	Male	Female	Both Sexes
All Ages:			
North Zone	1.6 (1.2,2.0)	2.0 (1.6, 2.4)	1.8 (1.4, 2.2)
South Zone	2.7 (2.3, 3.0)	3.3 (2.9, 3.7)	3.0 (2.5, 3.5)
Total Province	2.3 (1.9, 2.9)	2.9 (2.5, 3.5)	2.6 (2.3, 2.9)
Aged 35+ only:			
North Zone	4.6 (3.5, 5.7)	6.0 (4.7, 7.4)	5.3 (4.2, 6.4)
South Zone	7.5 (6.5, 8.4)	9.1 (8.0, 10.1)	8.1 (6.8, 9.4)
Total Province	6.6 (5.5, 8.1)	8.1 (7.2, 9.8)	7.2 (6.3, 8.1)

Note: Numbers in parentheses refer to the 95% confidence interval of the prevalence

Table II. Therapy for Blood Sugar Control in 622 diabetics.

Diet (+/- Exercise)	171	27.5%
Oral Medication	303	48.7%
Insulin	143	23.0%
Other Therapy (Traditional Medicine)	5	0.80%
Unknown Therapy	9	1.5%

*Therapy unknown for 9 diabetics. Results reported for 622 diabetics.

ized prevalence ratio is 2.53 (95% CI: 2.77, 2.58).

Of the 636 reported persons with diabetes, type of therapy was reported in 622 cases (Table II). Among those with diabetes for greater than 20 years, 62.5% were using insulin compared with 13% who had the disease for less than five years.

Diabetic complications were reported as present in 48% of individuals with diabetes. The presence of complications increased with duration of disease and age. Complications included vision155/304 or 51%, neuropathy 97/304, 32 %. kidney 95/304, 12 %, heart disease 176/304, 58 %.

Of the 82 communities that responded to the survey, 50 provided information regarding the number of women diagnosed with gestational diabetes. Of these 50 communities, 36 provided information on the number of births during the specified five year period. For the other 14 communities, the total number of live-births during the five years from 1992 to 1996 inclusive was determined using Indian and Northern Affairs Canada's Indian Population Register. Among the 50 communities, the period prevalence of gestational diabetes was 28 cases per 1,000 live-births.

DISCUSSION

The prevalence of diabetes mellitus in British Columbia First Nations is increasing. The majority of diabetic persons are older than 35 years. The prevalence in this study (2.6% overall) was less than that reported in the Aboriginal Peoples' Survey (4.3%), with significant regional variation. There appears to be a north-south gradient, with a higher prevalence in southern communities. This pattern has been found in other First Nations in Canada (5). In the over 35 years age group, British Columbia First Nations people

REFERENCES

1. Martin JD, Yidegiligne HM. Diabetes Mellitus in the First Nations Population of British Columbia, Canada. Proceedings of the 10th International Congress on Circumpolar Health. Anchorage, Alaska 1998: 335-9.
2. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995-2025: prevalence, numerical estimates, and projections. Diabetes Care 1998; 21(9):1414-31.
3. Health Canada. Diabetes Among First Nations People - Information from the 1991 Aboriginal Peoples Survey carried out by Statistics Canada. July 1997.
4. Health Canada. National Database on Breastfeeding among Indian and Inuit Women in Canada- A Summary of Regional Surveys of Infant Feeding Practices, 1993 - 1994.
5. Pioro MP, Dyck RF, Gillis DC. Diabetes prevalence rates among First Nations adults on Saskatchewan reserves in 1990: comparison by tribal grouping, geography and with non-First Nations. Can J Public Health 1996; 87(5):325-8.
6. Rosenbloom AL, Joe JR, Young RS, Winter WE. Emerging epidemic of type 2 diabetes in youth. Diabetes Care 1999; 22(2):345-54.
7. Dean H. NIDDM-Y in First Nation children in Canada. Clin Pediatr 1998; 37(2):89-96.
8. Rodrigues S, Robinson E, Gray-Donald K. Prevalence of gestational diabetes mellitus among James Bay Cree women in northern Quebec. Can Med Assoc J 1999; 160(9): 1293-7.
9. Harris SB, Caulfield LE, Sugamori ME, Whalen EA, Henning B. The epidemiology of diabetes in pregnant Native Canadians: A risk profile. Diabetes Care 1997; 20(9): 1422-5.
10. McCance DR, Pettitt DJ, Hanson RL, Jacobsson LTH, Knowler WC, Bennett PH. Birth weight and non-insulin dependent diabetes: thrifty genotype, thrifty phenotype, or surviving small baby genotype? Br Med J 1994; 308:942-5.

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have a significantly higher age-standardized prevalence of diabetes than non First Nations people, especially among females.

This survey counted 7 persons with diabetes (1.1% of all reported cases) who were diagnosed before the age of 20. It is likely that these are cases of type 2 diabetes with early onset in youth, a phenomenon that has been observed in other Aboriginal populations (6,7)

Approximately one half of the diabetic persons in this study were reported to have at least one complication that may be linked to diabetes, a prevalence similar to that among other First Nations. However, more standardized methods are needed to ascertain the true prevalence of complications.

The gestational diabetes prevalence of 28 cases per 1,000 live-births is similar to the birth prevalence (27 per 1,000 live-births) found in the British Columbia component of a national study on breast-feeding among Indian and Inuit women (births from 1990 to 1994) (4), and is greater than the prevalence of 18 per 1,000 live-births reported for the general population of British Columbia (births from 1987 to 1994). The prevalence found in our survey is much lower than those reported for the James Bay Cree of northern Quebec (128 per 1,000 live-births) (8) and in the Ojibwa-Cree of northern Ontario (84 per 1,000 live-births) (9).

The relative youth and high reproductive potential of the British Columbia First Nations population emphasizes the importance of screening for gestational diabetes and the need for appropriate education, therapy, and surveillance once it is diagnosed. These women and their children are at higher risk of type 2 diabetes and therefore are a group towards whom primary and secondary prevention efforts should be directed.

If the current incidence of diabetes remains unchanged it is estimated that the number of Aboriginal people with diabetes in Canada will triple by the year 2016 (10). The importance of primary prevention, early appropriate lifestyle interventions and culturally relevant care must be stressed to reduce the future burden of this epidemic.