DIABETES RESEARCH

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Review

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Diabetes in the Northwest Territories

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INTRODUCTION

An estimated 2.7 million (7.6%) Canadians were living with diabetes in 2012.[1] Internationally, Canada has the fourth highest rate of diabetes, behind Mexico, the United States and Portugal.[2] The prevalence of diabetes in Canada has doubled since 2000, and is expected to keep increasing.[2] The Northwest Territories (NWT) is one of three territories located in the most Northern part of Canada. In the NWT, the prevalence of diabetes was estimated to be 5.5% in 2008/2009.[3] Approximately 200 new cases of diabetes are diagnosed each year in the NWT, contributing to the increasing prevalence of diabetes across the territory.[3] Aboriginal populations are at a disproportionately higher risk of developing diabetes, post adoption of a more Westernized culture.[4] With 51% of NWT's population of 43623 identifying as Aboriginal, coupled with an aging population, the burden of diabetes in the NWT is expected to increase in the coming years.[5]

To help combat the anticipated growth in the burden of disease in the NWT, specific screening and diagnosis clinical practice guidelines for type 2 diabetes were developed in 2014 in consultation with the Canadian Diabetes Association (CDA).[6] According to the guidelines, a diagnosis of diabetes is made if any one of three tests for diabetes has a positive result: Fasting Plasma Glucose (FPG), two hour 75 g Oral Glucose Tolerance Test (OGTT) and Glycated hemoglobin (A1C) (Table 1). Screening for diabetes is implemented based on risk for developing diabetes, established from an NWT adapted Canadian Diabetes Risk Questionnaire (CANRISK) assessment.[7] These adapted guidelines recommend annual screening starting at age 30 for those at high risk, every two years starting at age 30 for those at moderate risk, and every three years starting at age 40 for those at low risk.

Test	Result required for diagnosis
Fasting plasma glucose (FPG)	≥7.0 mmol/L
2-hour plasma glucose in 75 g oral glucose tolerance test (OGTT)	≥11.1 mmol/L
Glycated hemoglobin (A1C)	≥6.5%

Table 1: Required results for a diabetes diagnosis, based on NWT screening and diagnosis guidelines.

In addition to the implementation of the 2014 NWT Type 2 Diabetes Screening Diagnosis Clinical Practice Guidelines, a territory-wide diabetes registry has been legislated and will make diabetes a notifiable disease to the Department of Health and Social Services (DHSS) beginning on January 1, 2016. For this registry to be implemented effectively, accurate territory-wide prevalence rates were needed. In the winter of 2015, a prevalence review for the previous three year period (2012-2014) was undertaken.

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METHODS AND ANALYSIS

To ensure the highest capture rate of diabetes, both lab data and community level data were used. Lab data included all FPG, OGTT and A1C tests performed between 2012 and 2014. Community level data was obtained from a nurse in charge for smaller communities, a chronic disease management nurse for regional centers, and from the Electronic Medical Record (EMR) in communities where installed, for the 33 communities across the NWT. Specifically, nurses in the community health centers provided line lists of those living with diabetes in their community, whereas the EMR data extracts were used as the source of data for the 2 communities where it was installed. An individual was considered a case of diabetes if any one of the three lab tests was positive or if they were included on any of the community lists of individuals with diabetes. Due to the reliance on lab data, it was impossible to differentiate between type 1 and type 2 diabetes.

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 22 and Microsoft Excel 2010. Crude prevalence rates were calculated for the seven health authorities in the NWT as well as by age group. Age standardized prevalence rates were calculated for all other variables of interest using the 1991 Canadian Standard Population.[8] Standard errors and 95% confidence intervals were calculated for all variables.

RESULTS

The crude prevalence for 2014 was 6.7%. The age standardized prevalence for 2014 was 7.5%. The average age of the 2908 prevalent cases in 2014 was 58 years, with a range of 4 to 95 years. The average age of female cases was 57 years whereas it was 59 years in males. The oldest age group, 65 and older, had the highest prevalence rate at 31.6%. Rates decreased accordingly with decreasing age, with the youngest age group, 0-24 years, having the lowest prevalence of 0.3%. The 55-64 year old group had a prevalence of 18.9%, 45-54 had 10.5%, 35-44 years had 4.5% and 25-34 years had a prevalence of 1.6%. Males had an age standardized prevalence rate of 8.0%, while females had a rate of 6.9%.

NWT communities were grouped into three categories to describe community types: Yellowknife City, Regional Centres (Hay River, Fort Smith, and Inuvik, population size range: 2536 to 3689), and Small Communities (all remaining NWT communities, population size range: 71 to 2039).Regional Centres had the highest age standardized prevalence at 9.7%, followed by Yellowknife at 7.3% and Small Communities had the lowest prevalence at 6.2%.

Results were age standardized by specific ethnicity (Dene, Metis, Inuit and Non-Aboriginal). Metis people had the highest prevalence of diabetes at 10.12%, followed by Non-Aboriginal people at 7.8%, Dene people at 7.3% and Inuit people had the lowest prevalence at 5.3%. Non-Aboriginal males had the highest prevalence of diabetes at 9.2%, followed by Aboriginal females at 7.8%. Aboriginal males had a prevalence rate of 6.8% and Non-Aboriginal females had the lowest rate at 6.1%.

LIMITATIONS

While the data review provided accurate prevalence estimates, it is only a starting point for a territory wide diabetes registry. There were several limitations with the data and considerations in implementing the new diabetes registry. Firstly, there was no way to differentiate between Type 1, Type 2, or gestational diabetes from the lab data. The prevalence rates presented represent all diabetes in the NWT and are not limited to Type 2 diabetes. Additionally, without a date of diagnosis, it was impossible to calculate incidence or evaluate trends in prevalence. The implementation of the diabetes registry will eliminate some elements of this as diagnosis date will be made available.

While the combination of lab data and community level data provided a robust estimate of diabetes prevalence, it is still possible that cases of diabetes were missing from the data, especially if they were never screened or tested or don't have an NWT healthcare number (non-residents were excluded from the analysis). It is also possible that the threshold of any one positive test is too low, thereby falsely including identifying some non-diabetics as having diabetes. Finally, while the active resident list provided the most up to date community data, it is possible that the population in the NWT is highly mobile and therefore geographic distribution would be misrepresented in the data.

CONCLUSIONS

These results provide evidence of the high risk groups for targeting future diabetes programming, including prevention and management. The information from this prevalence review will be used to inform implementation of a territory wide diabetes registry and help establish where diabetes programming could best focus across the NWT. Diabetes prevalence rates have been increasing nationally and this is also the case in the NWT. The new diabetes registry will allow us to further monitor screening compliance with the new guidelines and better determine rates for pre-diabetes as well as incident diabetes cases. It will also allow further delineation of type of diabetes mellitus (Type 1, Type 2, other specified, unspecified) as per ICD 10 classification (E10-E14). The steps being taken will help better inform programs and services in order to reduce the burden of disease from diabetes in the NWT, reduce strain on the health care system and improve quality of life for those living with diabetes.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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