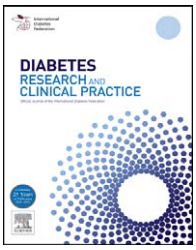
Contents lists available at ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

International Diabetes Federation



Brief report

What happens after community-based screening for diabetes in rural and Indigenous individuals?

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ARTICLE INFO

Article history:
Received 16 June 2009
Received in revised form
16 September 2009
Accepted 2 February 2010
Published on line 1 March 2010

Keywords:
Aboriginal
Indigenous
North American
Type 2 diabetes
Mass screening
Survey

ABSTRACT

Rural individuals (mostly Indigenous) were screened for undiagnosed diabetes and cardiovascular risk. A subsequent survey showed roughly half engaged in timely follow-up with the health care system. The Mobile Diabetes Screening Initiative identifies a substantial number of people needing medical attention, who may otherwise be "missed" through conventional healthcare delivery.

1. Introduction

Although community-based screening for certain conditions such as hypertension has proven useful [1], the value of type 2 diabetes screening is debatable [2,3]. While lifestyle interventions have been shown to decrease the risk of developing diabetes, and early blood glucose control reduces its complications [4,5], the overall effectiveness of screening is unknown. The Canadian Diabetes Association recommends screening members of Indigenous populations, comprised of First Nations, Métis (mixed blood) and Inuit; each with distinct cultural identities, governance and health care systems (Grade D, Consensus [6]). The American Diabetes Association discourages diabetes screening in community settings, citing lack of proof of benefit, and arguing that many patients fail to pursue treatment recommendations and/or follow-up to confirm screening results [3].

The Mobile Diabetes Screening Initiative (MDSi) is an opportunistic community-based diabetes screening program serving Métis and other remote Indigenous and non-Indigenous communities in northern Alberta, Canada. Roughly 70,000 Métis individuals live in Alberta, 10% of which live on Métis Settlements with distinct land bases in rural Northern Alberta [7].

To determine whether previously screened clients follow-up on recommendations, we designed a brief telephone survey assessing the actions taken in response to screening.

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0168-8227/$ – see front matter
doi:10.1016/j.diabres.2010.02.003

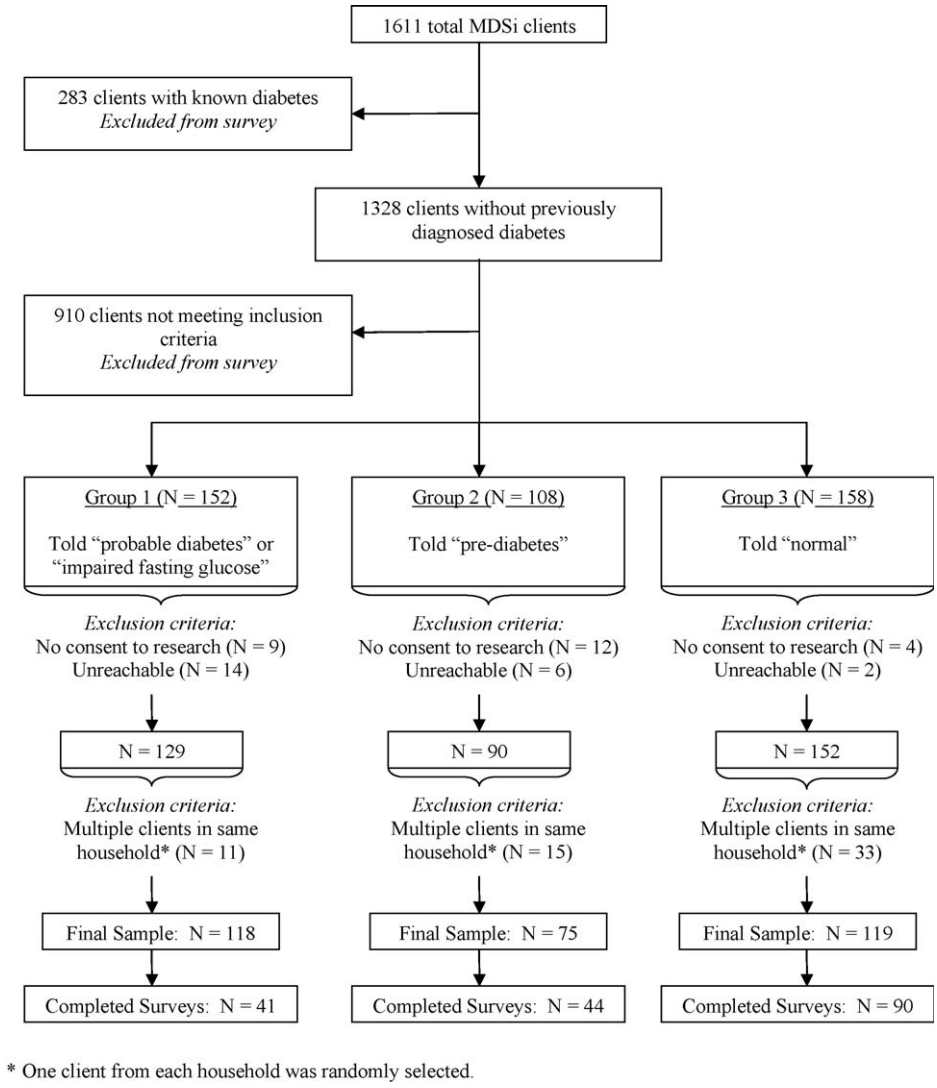

Fig. 1 – Flowchart of clients.

2. Methods

Between the years 2003 and 2008, MDSi screened 1328 clients (approximately 70% Métis, 20% First Nations and 10% non-Indigenous, all rural and remote) without diagnosed diabetes. Health professionals equipped with portable diagnostic equipment traveled to 15 communities providing diabetes screening services. Height, weight, waist circumference, blood pressure, fasting plasma glucose (FPG), hemoglobin A1c (A1c), lipid panel, and other measurements were taken. Detailed methodology has been reported [8]. Follow-up physician visits were encouraged depending on screening results, as were visits to dietitians or nurses with diabetes expertise.

Clients were divided into three groups in descending order of severity regarding glycemic results. Group 1: told they had impaired glucose tolerance (IGT) or probable diabetes (FPG $\geq$ 7.0 mmol/L and/or A1c $\geq$ 6.1 mmol/L); group 2: told they were at risk for diabetes or pre-diabetes (A1c $\geq$ 5.5 $<$ 6.1 mmol/L); and group 3: told they did not have diabetes or pre-diabetes (A1c $<$ 5.5 mmol/L). A time period between screening and survey was not defined for the more severe group 1, which was of most interest. Groups 2 and 3 clients were surveyed within three to nine months of MDSi screening, assuming that this would provide the best balance between recall and a chance to take action. Due to this difference in the time period between screening and survey, no statistical analysis for between group differences was done. Clients were excluded if they did not meet the time period criteria between screening and survey, did not consent to research, were unreachable by telephone, or were from households with multiple MDSi clients selected, in which case only one was randomly chosen. A client flowchart appears in Fig. 1. A total of 312 clients were included in the call list, with 118 from group 1, 75 from group 2 and 119 from group 3.

Since MDSi operates from September to June, telephone calls were made during the summers of 2006, 2007 and 2008, in Cree if required, and took 5–10 min. For clients less than 14 years of age, parents/guardians were contacted. A maximum of three call attempts were made. The primary survey question was whether clients correctly recollected the MDSi ''diagnosis'' of their glycemic status, and 16 questions were

Table 1 – Prevalence of selected clinical variables and client answers to survey questions. Values are percent.

	Group 1: probable diabetes or IGT	Group 2: at risk of diabetes or pre-diabetes	Group 3: normal glycemia	Aggregate data
	N = 41	N = 44	N = 90	N = 175
Normal weight (BMI < 25.0 adults; BMI < 85th percentile youth)	5%	16%	16%	14%
Normal lipids (TC/HDL < 3.9)	40%	30%	58%	49%
Normal blood pressure (<140/90 adults; <95th percentile youth)	51%	81%	84%	75%
Normal weight, lipids and blood pressure	5%	9%	10%	9%
Remembered glycemic results correctly	24%	55%	82%	61%
Incorrectly remembered glycemic results/ remembered less severe glycemic results[a]	76%/89%	45%/91%	25%/NA	39%/NA
Visited a physician after MDSi screening	66%	59%	37%	51%
Visited a physician because of MDSi glycemic screening results	39%	54%	39%	48%
Glycemic results confirmed by physician	56%	86%	77%	72%
Visited a diabetes nurse after MDSi screening	20%	9%	4%	9%
Visited a dietitian after MDSi screening	17%	7%	4%	8%
Felt a need to change eating habits	83%	64%	76%	74%
Reported an improvement in eating habits	76%	64%	72%	72%
Felt a need to change activity levels	59%	39%	72%	61%
Reported an improvement in activity levels	50%	59%	58%	57%
Felt a need to change stress levels	39%	16%	40%	33%
Reported an improvement in stress levels	44%	29%	33%	36%
Felt it was a good idea to be screened	98%	95%	97%	96%
Would recommend MDSi screening to family or friends	93%	91%	96%	95%
Felt they know more about diabetes after the screening process	78%	68%	63%	70%

Data was collected during July and August of 2006, 2007 and 2008 in Alberta, Canada.
[a] The percent of subjects that remembered less severe glycemic results was derived from the group of subjects that incorrectly remembered their glycemic results.

used to assess this (Table 1). The MDSi project was approved by the Health Research Ethics Board at the University of Alberta, and participants consent was obtained.

3. Results and discussion

A total of 175 clients (169 adults and six youth) completed the telephone survey, resulting in a 56% overall response rate. Reasons for non-response included failure to answer the telephone within three attempts (66%), telephone number not in use/wrong telephone number (22%), declined survey (10%), did not remember ever being screened (1%) and deceased client (1%). Response rates were lowest among clients told they had probable diabetes (34.7%), possibly due to the longer time period between screening and survey. Selected clinical variables and significant responses to the survey questions are shown in Table 1. It can be seen that regardless of glycemic results, risk factors for diabetes were almost universally present.

Roughly two-thirds of MDSi clients correctly remembered their glycemic findings. However, only 24% of clients told they had probable diabetes correctly remembered this, suggesting a degree of ''denial''. Overall 51% of individuals indicated visiting a physician after screening, and visits to diabetes nurses and dietitians (integral components of a recommended multi-disciplinary diabetes care team [6]) were rare. However, it is encouraging that for those who followed-up with a physician, MDSi's diagnosis was confirmed for three-quarters of respondents. Also encouraging, the majority (66%) of those told they had probable diabetes visited a physician. Taken together, the results indicate areas where MDSi could improve, namely by providing better explanations of glycemic results, and the need for confirmation, given that Indigenous individuals with diabetes experience complications more frequently than other groups [9–11]. However, our results also suggest system factors probably preclude adequate follow-up, such as the lack of specialized nurses and dietitians, lack of time or resources of available physicians, or lack of client resources to seek medical care [12].

Indigenous Canadians suffer prevalence rates of obesity and diabetes twice as high as the general population [13]. Moreover, rural individuals in western Canada have a higher prevalence of obesity compared to the general population [14]. Not surprisingly, in our survey most clients reported they felt a need to change their lifestyle habits to improve their overall health. Although the majority of clients reported some improvement in at least one lifestyle factor, whether MDSi's efforts actually improve client health is unknown, pending forthcoming longitudinal clinical data.

Our results suggest that MDSi is identifying/referring people who require medical attention, who may not otherwise access (or have access to) diabetes-related health care. It is encouraging that almost all respondents indicated MDSi

screening was a good initiative and would recommend it to others. Also, more than two-thirds of respondents indicated they knew more about diabetes after being screened. The responses suggest that screening was effective in increasing both individual and community-level diabetes awareness and knowledge translation.

Self-reports are often subject to over- or under-estimation, hence the accuracy of the self-reported answers could be challenged. Due to the small number of clients and the group differences in the time period between screening and survey, our ability to compare the groups was limited. Nonetheless, MDSi is ongoing and our preliminary work provides rationale for future quantitative and qualitative research. In summary, our findings suggest that community-based screening for diabetes identifies a substantial number of people needing medical attention.

Acknowledgements

This study was funded by Alberta Health and Wellness and University of Alberta.

Conflict of interest

The authors declare that they have no conflict of interest.

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