Perception of offspring risk for type 2 diabetes, among patients with type 2 diabetes and their adult offsprings

1) Masakazu Nishigaki, RN, M.Hlth.Sc
   1) Koji Kobayashi, RN, PhD
   1) Takako Hitomi, RN, M.Hlth.Sc
   2) Taeko Yokomura, RN
   2) Mitsunao Yokoyama, MD, PhD
   2) Naoto Seki, MD, PhD
   1) Keiko Kazuma, RN, PhD

1) The Graduate School of Medicine, School of Health Sciences and Nursing, Dept. of Adult Nursing, The University of Tokyo
2) Social Insurance Funabashi Central Hospital

Running Title: Diabetes risk perception of patient and offspring

Corresponding author: Masakazu Nishigaki
Address: Adult Nursing, 7-3-1, Hongo, Bunkyo-ku, Tokyo, Japan
nishigaki-tky@umin.ac.jp

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Relatives of type 2 diabetes patients are at higher risk for type 2 diabetes, as they are likely to share genetic predisposition and have similar lifestyle habits (1). To actively involve high-risk individuals in prevention, recognition of disease risk is crucial (2). Some studies have suggested that Japanese are genetically predisposed to diabetes (3,4), so recognition of risk by high-risk Japanese individuals is particularly important. In addition, patients with diseases involving genetic predisposition need to advise and warn their offspring about risks associated with the disease (5,6). Diabetic parents must therefore recognize the high-risk status of their offspring, but no studies have examined risk perception of parents and their offspring in Japan.

This self-administered questionnaire survey was conducted to clarify perceptions of type 2 diabetes patients regarding risk of diabetes in their offspring, and perceptions of adult offspring about their own risk for diabetes in Japanese.

RESEARCH DESIGN AND METHODS
Subjects in the present study comprised 164 pairs of type 2 diabetes patients (age <75 years) receiving treatment at a general hospital with a diabetes clinic located in the suburbs of Tokyo, and their offspring (≥20-years-old but <50-years-old, no diabetes or glucose intolerance). After obtaining written informed consent to participate in the study, the patient and offspring separately completed an anonymous questionnaire with unique ID to identify each parent/offspring pair. The present study was conducted from October to December 2005. The ethical committee of the University of Tokyo approved all study protocols.

The perception of offspring risk for type 2 diabetes was assessed among both patients and offspring as “the likelihood of your offspring/you developing diabetes in comparison to the general Japanese population”. The likelihood was evaluated from 3 perspectives: risk due to current lifestyle; risk due to family history; and overall risk. Response categories for each ranged from 1=“very likely” to 5=“very unlikely”. Results were tabulated, then inter-perspective comparison in each group and pairwise comparison in each parent/offspring pair for risk perception were conducted.

RESULTS
Backgrounds of subjects were as follows: male ratio in patients and offspring was 54.3% and 40.2% (p=0.01, χ² test), respectively; mean age was 64.0 years (SD=6.5) and 33.4 years (SD=7.6), respectively; mean BMI was 24.0 (SD=3.6) and 22.9 (SD=3.8) (p<0.01, t test), respectively; mean educational years was 12.6 years (SD=2.6) and 14.3 years (SD=1.9), respectively, and 58.5% of pairs were living together. Among patients, 23.2% were receiving insulin therapy, and 26.2% reported diabetes-related complications.

About 40% of patients stated that their offspring were more likely to develop diabetes from the perspective of lifestyle habits, and about 50% from the perspective of family history and overall view. No inter-perspective differences in risk perception were seen. Among offspring, about half recognized that they were at higher risk for diabetes compared to the general population from the perspective of lifestyle habits, and about 50% from the perspective of family history and overall view. No inter-perspective differences in risk perception were seen. Among offspring, about half recognized that they were at higher risk for diabetes compared to the general population from the perspective of lifestyle habits, and about 50% from the perspective of family history and overall view. No inter-perspective differences in risk perception were seen. Among offspring, about half recognized that they were at higher risk for diabetes compared to the general population from the perspective of lifestyle habits, and about 50% from the perspective of family history and overall view. No inter-perspective differences in risk perception were seen. According to Steel-Dwass test for multiple comparisons (Table).

Pairwise comparison showed that offspring perceived their risk related to family history as well as their overall risk significantly higher than their parents (p<0.001, Wilcoxon’s sign rank sum test), but no difference was found in lifestyle-related risk.

CONCLUSIONS
In the present study, perceptions of risk for diabetes among offspring were higher compared to previous research involving both patients and offspring (7-9). Two possible
Diabetes risk perception of patient and offspring

causes may contribute to this higher risk perception. First, optimistic biases about risk perception and cross-cultural variations might exist between current and previous research. Many studies have described people underestimating risks of unfavorable events, representing optimistic bias (10). In addition, some research has shown cultural variations in optimism, with Western people more optimistic than Oriental people (11). These factors were related to lower risk perception in previous Western research. However, a previous study in Korea showed much lower risk perception than seen in the present research(12), suggesting that the present subjects still displayed relatively high risk perception even after considering possible pessimistic trends in Asian countries.

Secondly, an increasing awareness of diabetes may have affected this result. The present results are comparable with figures obtained from patients educated about genetic risks (13). In Japan, studies on genetic predispositions for diabetes have been conducted as part of national projects since 2000(4,14), and the mass media has been actively reporting lifestyle diseases such as metabolic syndrome. The present results could indicate that these national projects have successfully raised awareness of diabetes among Japanese.

This study also clarified marked differences in risk perception between diabetic parents and offspring from both quantitative and qualitative perspectives. Offspring displayed greater recognition of diabetes risks than parents, contradicting a perception by healthcare professionals that offspring view diabetes as something that does not concern them (15). More interestingly, inter-perspective differences were found between patients and offspring as qualitative differences in risk perception. Patients perceived diabetes risks for offspring as equally low for lifestyle-related and hereditary risk, whereas offspring perceive hereditary risk as much higher than lifestyle-related risk. This may reflect self-serving thinking among both patients and offspring. Parents would feel guilty about passing susceptibility for a disease to their children (16), and so probably downplay hereditary risk to reduce feelings of guilt about genetic predisposition toward diabetes. Conversely, offspring downplay their own responsibility by emphasizing hereditary risks more than lifestyle-related risks.

These findings have some implications: if patients are to inform their offspring about disease risks more effectively, their own potential feelings of guilt need to be tackled first. If offspring are to take a more active stance towards prevention, realization of the importance of their own actions is particularly important in terms of risk.

Whether these findings are specific to Japanese diabetes patients and their offspring remains unclear, due to limitation of this study in not containing a control group of non-diabetic adults. Further research investigating risk perceptions in the Japanese general population is needed to confirm and clarify these findings.
REFERENCES


Diabetes risk perception of patient and offspring

Table: Patients and offsprings’ perception of risk for diabetes from three perspectives

<table>
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<tr>
<th></th>
<th>very unlikely</th>
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<th>likely</th>
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<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
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<td>patients</td>
<td></td>
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<td>Current lifestyle habits</td>
<td>3 (1.8)</td>
<td>24 (14.6)</td>
<td>65 (39.6)</td>
<td>54 (32.9)</td>
<td>18 (11.0)</td>
<td>0.56* 0.93*</td>
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<td>8 (4.9)</td>
<td>26 (15.9)</td>
<td>44 (26.8)</td>
<td>57 (34.8)</td>
<td>29 (17.7)</td>
<td>0.56† 0.74*</td>
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<td>Overall view</td>
<td>5 (3.0)</td>
<td>22 (13.4)</td>
<td>59 (36.0)</td>
<td>59 (36.0)</td>
<td>18 (11.0)</td>
<td>0.93† 0.74*</td>
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<tr>
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</tr>
<tr>
<td>Current lifestyle habits</td>
<td>3 (1.8)</td>
<td>17 (10.4)</td>
<td>62 (37.8)</td>
<td>59 (36.0)</td>
<td>23 (14.0)</td>
<td>&lt;0.001* 0.07#</td>
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<td>1 (0.6)</td>
<td>10 (6.1)</td>
<td>31 (18.9)</td>
<td>74 (45.1)</td>
<td>48 (29.3)</td>
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<td>10 (6.1)</td>
<td>48 (29.3)</td>
<td>78 (47.6)</td>
<td>26 (15.9)</td>
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Offsprings’ risk perception is:

<table>
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<th></th>
<th>Lower than his/her parent</th>
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<tr>
<td>Current lifestyle habits</td>
<td>44 (26.8)</td>
<td>60 (36.6)</td>
<td>60 (36.6)</td>
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<tr>
<td>Family history</td>
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<td>88 (53.7)</td>
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<td>Overall view</td>
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<td>69 (42.3)</td>
<td>67 (41.1)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Total number of subject is 164. Only “overall view” perspective is total of 163 due to a patient’s missing value.

*: compare with “Family history” perspective  #: compare with “Overall view” perspective  †: compare with “Current lifestyle habits” perspective