Family History of Diabetes: Incorporating Genomics Data into the BRFSS

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Research Objectives

»Given the increasing prevalence rate of diabetes, prevention of the disease among high risk individuals could substantially reduce the burden of diabetes.

»Evidence has revealed that individuals with a family history of diabetes are at increased risk of developing diabetes themselves, and behavior changes are associated with a reduction in risk.

»This study evaluated the usefulness of family history as a tool to identify persons at high-risk for diabetes. Specifically, the authors assessed:

1. family history of diabetes as an independent risk factor for the disease;
2. the association of family history of diabetes with perceived risk and with other known risk factors for the disease

Study Design

»Data from the 2005 Oregon Behavioral Risk Factor Surveillance System (BRFSS) (N=6560) was used to evaluate our research hypotheses.

»Pearson chi-square tests were used to detect if there were differences in population attributes, provider practices, and select behaviors among the three familial risk groups.

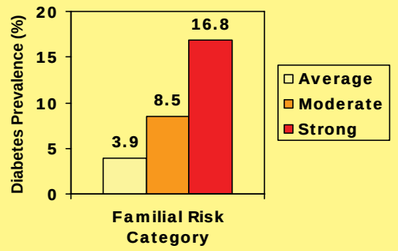
»Logistic regression was used to calculate adjusted odds ratios (OR) and 95 percent confidence intervals (CI) for the predictors of diabetes.

Principal Findings

»Individuals with a strong family history of diabetes (two or more first degree relatives with diabetes) were approximately 5x more likely to develop diabetes compared to individuals without a family history.

»Those with a positive family history of diabetes were more likely to report that their health care provider: collects family history information, discusses risk of developing diabetes, and makes recommendations to engage in lifestyle changes.

Diabetes Prevalence by Familial Risk



Average = no first degree relative with diabetes
Moderate = one first degree relative with diabetes
Strong = two or more first degree relatives with diabetes

KEY REFERENCES

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Logistic regression analysis for predictors of diabetes

Independent variable	Adjusted odds ratio[1]	95% confidence interval	Unadjusted odds ratio	95% confidence interval
Age (>45 years vs. <45 years)	2.2	1.4, 3.5	5.4	3.9, 7.4
Sex (Male vs. female)	1.2	0.9, 1.5	0.9	0.8, 1.2
Race & Ethnicity (Hispanic or Latino vs. Non-Hispanic white) ethnicity (Hispanic or Latino vs. Non-Hispanic white)	2.8	1.2, 6.7	1.2	0.6, 4.5
SES Low SES vs. not low SES	1.2	0.9, 1.6	1.3	1.1, 1.7
Physical activity (Did not meet recommendations vs. met recommendations)	1.3	1.0, 1.7	2.3	1.8, 2.9
Obesity (Obese vs. not obese)	2.5	1.9, 3.2	3.9	3.2, 4.9
Hypertension (High vs. low)	3.7	2.8, 4.9	7.7	6.2, 9.5
High Cholesterol (High vs. low)	2.2	1.7, 2.8	3.3	2.6, 4.1
Moderate familial risk of diabetes (vs. not moderate familial risk)	2.1	1.5, 2.9	1.5	1.2, 1.9
Strong familial risk of diabetes (vs. not strong familial risk)	4.7	3.4, 6.6	4.1	3.5, 5.2

[1]Adjusted odds ratios account for all other covariates in the model

Providers practices, perceived risk, and select behaviors for the total population and by familial risk

Dependent variable	Average adjusted odds ration	Moderate adjusted odds ratio	95% confidence interval	Strong adjusted odds ratio	95% confidence interval
Collection of family history of diabetes	1.0	1.7	1.3, 2.0	3.3	2.5, 4.3
Discussion of risk by a healthcare provider[1]	1.0	2.0	1.7, 2.4	3.9	3.2, 4.7
Recommendations by a healthcare provider	1.0	1.5	1.3, 1.8	1.8	1.5, 2.1[2]
Perceived risk of diabetes[1] (Very or somewhat worried vs. Not at all or slightly worried)	1.0	2.0	1.6, 2.5	4.8	3.9, 6.0
Reported lifestyle changes[1]	1.0	1.5	1.2, 1.7	1.7	1.4, 2.1
Current smoker	1.0	1.0	0.8, 1.2	1.3	1.1, 1.6
Cholesterol screening	1.0	1.4	1.1, 1.7	1.3	1.1, 1.7
Physical activity (Recommendations met vs. recommendations not met)	1.0	1.0	0.9, 1.2	1.1	0.9, 1.3[3]
Fruit and vegetable consumption(> 5 servings per day vs. < 5 servings per day)	1.0	1.2	1.0, 1.4	1.1	0.9, 1.3
Obesity(Obese vs. not obese)	1.0	1.1	0.9, 1.3	2.1	1.7, 2.5

[1]Among those without diabetes
[2]Adjusted for obesity
[3]Adjusted for age and obesity

Conclusions

»Integrating family history of diabetes into clinical practice offers the opportunities both to improve the effectiveness of diabetes screening, and to promote interventions aimed at preventing or delaying the development of diabetes in high-risk individuals.