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The effects of a patient-based risk assessment prompt on diabetes screening

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Abstract

Objective: Previous research has determined that nurse-based diabetes risk assessment increases screening and preventive services for patients at risk for type 2 diabetes. This pilot study tested the impact of a diabetes risk assessment completed by patients without nursing assistance.
Research design and methods: Patients from a family medicine residency clinic completed an American Diabetes Association Risk Assessment questionnaire. Intervention subjects presented completed questionnaires to their physicians. Control subjects returned the questionnaire to the research assistant. Primary endpoints were the number of persons receiving diabetes screening and the number of persons with newly diagnosed diabetes. The associations between the intervention and diabetes screening and diagnosis were assessed using univariate and multivariate logistic regression models.
Results: This study included 511 subjects (256 in the intervention group and 255 in the control group). Comparing intervention to control subjects, there was no difference in fasting glucose screening rates. However, odds of diabetes diagnoses were significantly higher using univariate analysis (OR 5.2; 95% CI 1.1–24.3, $p = .036$) and approached statistical significance after adjusting for other risk factors (OR 4.6; 95% CI 0.92–23.2, $p = .063$).
Conclusions: A simple patient-based risk assessment used in the outpatient setting may represent a simple, economical method for discovering previously-undiagnosed type 2 diabetes.
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Keywords: Diabetes mellitus; Health promotion; Mass screening; Preventive health services; Reminder systems

1. Introduction

Type 2 diabetes, the most prevalent form of diabetes [1], has increasingly become a major world problem. More than 170 million cases of type 2 diabetes exist in the world today, and it is estimated that by the year 2030, the number will climb to 366 million [2]. In the United States, there are approximately 17 million people with diabetes and another 12 million with pre-diabetes (impaired fasting glucose or impaired glucose tolerance) [3]. The chronic hyperglycemia seen in patients with diabetes can lead to nephropathy, neuropathy, retinopathy, coronary heart disease, stroke,

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and peripheral vascular disease [1,4,5]. However, early detection and prompt treatment may reduce the burden and complications of diabetes [6]. Both the American Diabetes Association and the American Academy of Clinical Endocrinologists recommend early screening and intervention for diabetes [7,8]. In spite of these recommendations, there are an estimated 5 million people with undiagnosed diabetes in the United States alone [4].

There have been a number of studies regarding the methods and costs of screening for diabetes, including opportunistic screening and population-based community screening. Opportunistic screening is more prevalent, in part, because community screening may be poorly targeted and could result in failure of the patients to obtain appropriate follow-up care [7]. Researchers have demonstrated that one-time opportunistic screening may lead to a diagnosis of type 2 diabetes an average of 5 years earlier [9]. Also, the cost per true positive case identified by opportunistic screening is less than one-third the cost of identifying a true positive case in population-based screening. Therefore, it appears that opportunistic screening may be more efficient, more effective, and less costly than population-based community screening [7,9–13]. As a result, population-based screening is currently not recommended by the American Diabetes Association (ADA), Centers for Disease Control and Prevention (CDC), or the United States Preventive Services Task Force (USPSTF) [7,13].

Although many reports have been published concerning population-based community screening, there have been a small number of reports concerning opportunistic screening and intervention in office-based settings [3,4,7,12,14,15]. Although the effectiveness of early detection through screening has not been determined, there is good indirect evidence to support screening of high-risk individuals [1,16]. The accepted screening methods for diabetes include fasting plasma glucose (FPG) and an oral glucose tolerance test (OGTT) [6,7]. FPG is the most common (and preferred) method due to its ease of administration and low cost [7,12,14]. Because type 2 diabetes has an estimated latency period of 4–12 years [12], the ADA and CDC recommend screening high-risk individuals at 3-year intervals beginning at age 45, especially those with a BMI $\geq 25\ kg/m^2$ [1,7,13]. Screening should also be considered at a younger age and/or more frequently in overweight patients with other risk factors, such as a family history of diabetes, previously identified impaired fasting glucose (IFG) or impaired glucose tolerance (IGT), hypertension, at-risk race (e.g., African-American), and habitual physical inactivity [1].

One study employing a risk assessment has determined that office-based opportunistic screening effectively increases the proportion of persons receiving diabetes screening and prevention counseling [17]. In that study, patients completed a risk assessment in the waiting room and a nurse scored the assessment. The nurse then prompted the physician if the patient was high-risk for diabetes [17]. The study, however, required a training session for the nurses and required nurse time to score each prompt and cue the physician regarding the patient's risk status. There are currently no studies on the use of a risk questionnaire completed by the patient and delivered directly to the physician. The authors hypothesized that an approach that bypasses the nurse may have the following advantages: first, it is a patient-centered approach that encourages patients' involvement in their own risk assessment and follow-up; second, it would decrease the need for a training session for the nurse; finally, it would eliminate the need for the nurse to prompt the physician because the patient would deliver the completed risk assessment directly to the doctor. The purpose of this study was to determine whether a risk questionnaire completed by the patient in the waiting room and handed to the doctor at the time of the visit would increase diabetes screening and diagnosis of previously undiagnosed diabetes in high-risk subjects.

2. Methods

2.1. Location and selection of subjects

This study was conducted at a family practice residency program located in Middle Georgia. The healthcare providers in the study consisted of 22 residents, 8 faculty members, and 1 physician assistant. On average, the clinic treats 104 patients per day of all ages, both sexes, and all diseases. Approximately one-third of the patients treated at this clinic are covered by Medicare, one-third by Medicaid, and one-third by private insurers.

The subject recruitment and inclusion/exclusion criteria are as follows: all subjects for the study were recruited in the waiting room by a research assistant who asked them to participate in a study for the early detection and intervention of chronic diseases. All consenting subjects 18 years of age and older participated. Subjects younger than 18 years old, those with previously diagnosed diabetes, prisoners, those who were mentally retarded, and those who did not have an office visit on the same day (but merely a lab visit) were excluded from the study. A power analysis that was computed a priori indicated that a minimum of 526 subjects was needed to determine with statistical significance the effect of the risk questionnaire intervention on diabetes screening and prevention. This study was approved by the Mercer University Institutional Review Board.

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