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Telemedicine Management of Diabetics in an Underserved Community

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Introduction

Information technology via telemedicine offers the potential for cost-effective and active management of type 2 diabetes mellitus for people in high-risk underserved communities such as Harlem, NY and the Bronx, NY. Adults with type 2 diabetes mellitus have heart disease death rates about 2 to 4 times higher than adults without diabetes, and the risk for stroke is 2 to 4 times higher among people with diabetes.¹ Telemedicine is the use of telecommunications technology for medical diagnostic, monitoring, and therapeutic purposes to communicate information instantaneously from one location to another, such as from a patients' home to a hospital.²

Conventional diabetes management involves a patient diagnosed with type 2 diabetes mellitus seeing a physician in an outpatient setting for monitoring, and meeting with a diabetes educator who recommends lifestyle and dietary changes. If these lifestyle interventions are not adequate to bring the blood glucose levels under control, the physician may recommend pharmacological interventions such as treatment with metformin or another medication to increase insulin sensitivity and secretion.

The New York City Health and Hospitals Corporation's (NYC HCC) Housecalls program supplements conventional diabetes management by providing free tele-glucometers to patients diagnosed with type 2 diabetes mellitus. These glucometers transmit the patient's daily blood glucose measurements back to the hospital and alert the medical staff to any needed changes in the treatment regimen. Utilizing only an existing phone line and a "tele-glucometer" rigged to plug into a phone line, clinicians have the opportunity to monitor the daily glycemic status of patients without having to see the patient in clinic.

The use of telemedicine to assist residents of East Harlem with controlling their blood glucose levels can function in meeting the two main goals of Healthy People 2010: increase the quality and years of healthy life and to eliminate healthcare disparities.³ A previous study on Army diabetics has indicated that telemedicine leads to better glycemic control and fewer complications than conventional treatment in controlling diabetes.⁴ Using a home telemedicine system to deliver care to patients with type II diabetes resulted in a 16% reduction in Hemoglobin A1C levels (from 9.5 to 8.2%) and a 4% mean weight reduction (from 214.3 to 206.7 pounds) during a 3-month period of monitoring.⁴

Our study aims to quantify the improvement experienced by NYC HCC diabetics treated at placed on the Housecalls telemedicine monitoring program and compares them to NYC HCC patients treated via the conventional approach of medication and lifestyle recommendations combined with regularly scheduled outpatient medical visits.

Methods

The patients analyzed were NYC HCC patients that were newly diagnosed with type 2 dia-

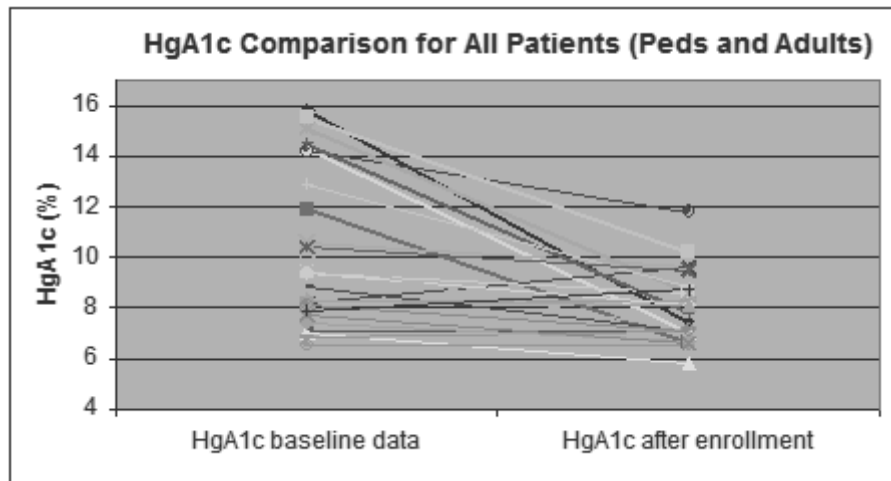
betes mellitus. Hemoglobin A1C levels from before the patient was enrolled in the Housecalls program served as baseline reference values. Hemoglobin A1C serves as a stable mean value of a patient's constantly changing blood glucose levels averaged over a multi-week period. We compared the baseline Hemoglobin A1C levels to the levels recorded after the patient was enrolled in Housecalls for at least 3 months.

Results

The initial results indicate that the Housecalls program is effective in improving compliance and management of diabetes. Of the patients with an HbA1c level measured within 3 months of start of program and 3 months after enrollment, 19 of 22 (86%) had a decrease in HbA1c, while the remaining 3 patients had no change in HbA1c.

Discussion

The initial success of the program is encouraging and demonstrates a great potential for the use of telemedicine in monitoring chronic disease. One of the largest problems in providing care to patients of underserved areas is loss to follow up, and telemedicine offers a cheap and effective solution to reduce such losses. The costs of providing the tele-glucometer would be largely offset by the reduced expenses of treating diabetes complications if this method is indeed effective in improving long term glycemic status. The initial results are encouraging and certainly warrant more detailed and in-depth analysis of this simple tool.



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