JNP

Nurse Practitioner Implementation of a Glycemic Management Protocol

Elise L. Powell, DNP, FNP, Sandra Engberg, PhD, RN, FAAN, and Linda Siminerio, PhD, RN, CDE

ABSTRACT

As the prevalence of type 2 diabetes continues to increase, nurse practitioners (NPs) will play a vital role in providing care for these individuals. NPs generally have more time to spend with patients with type 2 diabetes, and time to address diabetes-related issues. This evaluation was designed to determine if NP utilization of a glycemic protocol for medication intensification in patients with type 2 diabetes would result in a reduction of fasting blood glucose concentrations and hemoglobin A1C levels. There was a significant improvement in both fasting blood glucose concentrations and hemoglobin A1C.

Keywords: hemoglobin A1C (HbA1C), nurse practitioner (NP) led, quality improvement, standardized protocols, type 2 diabetes (T2D)

Type 2 Diabetes (T2D) is a chronic, progressive disease that affects 25.8 million Americans.[1] Patients with T2D with persistent hyperglycemia are at high risk for developing vascular disease-related complications.[2] These complications include: diabetic retinopathy, diabetic nephropathy, and peripheral neuropathy.[3] Patients with T2D have a risk of death from cardiovascular causes that is 2 to 6 times that of persons without diabetes.[4] The complexity of this illness makes treatment difficult. As a result, achievement of treatment goals for these patients remains elusive.[5]

Research has shown that access to care does not appear to be the major barrier to meeting treatment goals, but it is rather the result of missed opportunities for timely intervention during office visits.[5] *Clinical inertia* is defined as the failure to recognize the need to initiate or titrate therapy when indicated,[5] or recognition of the problem, but failure to act.[1] Research indicates that up to 75% of clinical inertia can be attributed to the physician.[5] Physicians typically have 10–15 minutes with each patient, and asymptomatic concerns related to controlling glycemia have not received the attention they deserve because other problems take priority.[3]

Diabetes is a burdensome disease that requires complex care and ongoing support for patient self-management. In a global study of diabetes patients, nurses are reported to be better listeners, act as intermediaries with families and physicians, provide self-management education, and have a high level of involvement in medication prescribing.[6] Nurse practitioner (NP) providers are reported to have more time to spend with patients, allowing them to focus on diabetes clinical management-related issues.[3] NPs have an opportunity to play a key role in the care of people with diabetes.[6] There is evidence that NPs improve clinical outcomes for patients with T2D in primary care practices through their capacity to initiate, change, and adjust medications without physician authorization.[7] Through the use of evidence-based protocols, specifically medication intensification protocols for managing glycemic control, NPs have access to a decision support tool to advance anti-hyperglycemic medications for patients with T2D. Glycemic algorithms dictate the timing of the interactions and, in most cases, medication changes, depending on the clinical situation. Therefore, timely and appropriate clinical decisions can be made on an ongoing basis.[3]

The purpose of this evaluation was to examine the effect of a diabetes medication intensification protocol on glycemic outcomes in adults with T2D, as measured by average fasting blood glucose (FBG) concentration and hemoglobin A1C (HbA1C).

METHODS

This investigation used a single group pre-posttest intervention design. The University Institutional Review Board (IRB) determined that the project was quality improvement and exempt from IRB review. Quality improvement approval was granted by the clinical setting and health system where the project was implemented.

The intervention took place in an urban primary care practice located in Pittsburgh, Pennsylvania. Patients had to be 18 years old or older, have received a T2D diagnosis at least 1 year before the baseline evaluation, speak and understand English, and be able to self-manage their diabetes. Patients meeting these criteria who had a HbA1C $\geq$ 8% and glucose home monitoring equipment were eligible to participate in the project. Potential participants were identified by the on-site practice-based diabetes educator with required physician referral. They were initially contacted via letter that detailed the project and its goals. They then received a follow-up phone call from the NP student (NPS) to confirm interest and verify willingness to participate in the project. During the phone call, detailed information about the project was provided, and any questions about the project and its goals were addressed.

After the NPS reviewed the patient's electronic medical record (EMR), patients completed a 20-minute baseline in-person visit at the practice site to confirm information obtained from the EMR, including time of diagnosis, current and previous medications prescribed for their diabetes, current nutrition and activity regimen, and previous participation in diabetes education. The patients' ability to test and document their blood glucose level was assessed. Patients were instructed to check their FBG for 3 days prior to the baseline visit. Recommendations were made for laboratory blood work if indicated.

INTERVENTION

Intensification of patients' diabetes medication regimens were based on the REMEDIES 4D protocol.[8] REMEDIES 4D is a standardized protocol designed to aid advanced practice providers through medication intensification for T2D. The protocol dictates timing and indication for diabetes medication initiation and intensification based on FBG concentrations. It includes attention to lifestyle modifications, initiation and addition of anti-hyperglycemic oral medications, and advancement to insulin therapy, if necessary. The protocol states that management should include diabetes self-education and ongoing diabetes support. Based on this, patients who had never seen a diabetes educator (5 out of 13) were referred for 1 visit for lifestyle counseling.

The NP in the practice site was also present for the baseline visit and in consultation with her; the NPS determined the initial medication changes based on patients' FBG levels and the REMEDIES 4D protocol. Baseline FBG levels were calculated based on the average of at least 3 FBG readings from the patient's blood glucose record. An HbA1C that was documented within the EMR 1 month prior to baseline was accepted as the baseline measure; if there was not an HbA1C level in the past month, one was ordered. The HbA1C was measured before diabetes education for the 5 patients who were referred.

Following the baseline visit, patients were instructed to test and record their FBG levels every morning. Subsequent medication changes occurred at 2-week intervals based on the average of 3 FBG readings recorded during the second week following a medication change or dose increase. At the end of the second week, the NPS contacted the patients by telephone to collect FBG levels. During the telephone call, as directed by the REMEDIES 4D protocol, if the FBG readings were $\geq$ 130 mg/dl, subsequent protocol-driven medication changes were initiated. The calls were variable in length, but generally 10 minutes or less. Except for the baseline visit when changes were initially made to patients' medications regimens, all intervention visits were conducted by telephone, with the NPS discussing all planned changes based on the REMEDIES 4D protocol with the practice NP before the telephone calls.

The same steps were followed every 2 weeks until the patient's average FBG was $\leq$ 130 mg/dl, or until the patient had been managed using the protocol for 10 weeks. Three months after the patient's 3-day average FBG reached the goal of $\leq$ 130 mg/dl, or following completion of the 10-week treatment protocol (whichever occurred first), a HbA1C was checked.