

Contents lists available at [ScienceDirect](#)

Canadian Journal of Diabetes

journal homepage:
www.canadianjournalofdiabetes.com


Original Research

Adherence to Guidelines for Inpatient Pharmacologic Management of Type 2 Diabetes and Glycemic Outcomes

Resheed Alkhiari MBBS ^a, Hussain Alzayer MD ^a, Jafar Aljazeera MBBS ^{a,*}, Thuva Vanniyasingam BSc ^b, Zubin Punthakee MD, FRCPC ^a

^a Department of Medicine, McMaster University, Hamilton, Ontario, Canada

^b Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada

ARTICLE INFO

Article history:

Received 1 April 2017

Received in revised form

8 May 2017

Accepted 10 May 2017

Keywords:

adherence
diabetes
guidelines
outcomes
inpatient

ABSTRACT

Objectives: Diabetes is often poorly managed in hospitals. This study assessed the level of adherence to current Canadian practice guidelines for inpatient pharmacologic management of type 2 diabetes and whether it affected the frequency of hyperglycemia or hypoglycemia.

Methods: Retrospectively, we assessed the first 3 days of routine inpatient capillary blood glucose measurement (CBGM) records for hyperglycemia (>8 mmol/L fasting, >10 mmol/L nonfasting) and hypoglycemia (<4 mmol/L) in adults with drug-treated type 2 diabetes admitted to internal medicine without metabolic decompensation or nil per os (NPO) status at 2 hospitals during October through December 2014. Patients, divided according to their admission orders into guideline-adherent versus guideline-nonadherent groups were compared for frequency of hyperglycemia and hypoglycemia. Factors predicting guideline adherence were assessed.

Results: Of 150 patients with diabetes who were admitted, 108 met entry criteria. A total of 89 patients received guideline-based care (82%), whereas 19 patients did not (18%). Charlson index and preadmission medications did not predict guideline-based care, but admitting physicians' seniority did (junior, senior resident, attending physician; $p=0.05$). In the adherent group, 43% of CBGMs were hyperglycemic, versus 64% in the nonadherent group ($p=0.01$). For hypoglycemia, proportions were 2% versus 1%, respectively ($p=0.21$).

Conclusions: Adherence to guidelines for inpatient type 2 diabetes management is good and may be greater with more training. Hyperglycemia was more common in patients who did not receive guideline-based care. Hypoglycemia was uncommon and did not appear to be more common in the guideline-adherent group, although numbers were small. These results may alleviate physicians' fear that providing adequate insulin to hospitalized patients may cause hypoglycemia.

© 2017 Canadian Diabetes Association.

R É S U M É

Objectifs : Dans les hôpitaux, la prise en charge du diabète est souvent médiocre. La présente étude a pour objet d'évaluer le niveau de respect des lignes directrices actuelles sur la prise en charge pharmacologique du diabète de type 2 chez les patients hospitalisés et l'influence que ce niveau pouvait avoir sur la fréquence de l'hyperglycémie ou de l'hypoglycémie.

Méthodes : Rétrospectivement, nous avons évalué l'hyperglycémie (>8 mmol/l à jeun, > 10 mmol/l non à jeun) et l'hypoglycémie (< 4 mmol/l) à partir des relevés des mesures systématiques de la glycémie capillaire (MGC) des 3 premiers jours chez les adultes atteints d'un diabète de type 2 traité par un médicament qui ont été admis en médecine interne sans décompensation métabolique ou *nil per os* (NPO) dans 2 hôpitaux d'octobre à décembre 2014. Après avoir divisé les patients en deux groupes selon leur ordre d'admission, soit le groupe respectant les lignes directrices et le groupe ne respectant pas les lignes directrices, nous avons comparé la fréquence de l'hyperglycémie et de l'hypoglycémie. Nous avons évalué les facteurs prédisant le respect des lignes directrices.

Résultats : Parmi les 150 patients diabétiques qui ont été admis, 108 répondaient aux critères d'inclusion. Au total, 89 patients ont reçu des soins fondés sur les lignes directrices (82 %), et 19 patients ont reçu

Mots clés :
respect
diabète
lignes directrices
résultats
patients hospitalisés

* Address for correspondence: Jafar Aljazeera, MBBS, Department of Internal Medicine, McMaster University, Internal Medicine Residency Office, Room 3W10A-C, 1280 Main Street West, Hamilton, Ontario L8S 4K1, Canada.

E-mail address: jafar.aljazeera@medportal.ca

1499-2671 © 2017 Canadian Diabetes Association.

The Canadian Diabetes Association is the registered owner of the name Diabetes Canada.

<http://dx.doi.org/10.1016/j.cjcd.2017.05.003>

des soins non fondés sur les lignes directrices (18 %). L'indice de Charlson et les médicaments avant l'admission ne prédisaient pas des soins fondés sur les lignes directrices, mais l'ancienneté des médecins présents à l'admission les prédisait (résidents *juniors*, résidents *séniors*, médecins traitants; $p=0,05$). Dans le groupe qui respectait les lignes directrices, 43 % des MGC montraient une hyperglycémie, alors que dans le groupe qui ne respectait pas les lignes directrices ($p=0,01$), 64 % montraient une hyperglycémie. En ce qui concerne l'hypoglycémie, les pourcentages étaient respectivement de 2 % et de 1 % ($p=0,21$). *Conclusions* : Le respect des lignes directrices sur la prise en charge du diabète de type 2 chez les patients hospitalisés est bon, mais plus la formation est avancée, plus le respect des lignes directrices est grand. L'hyperglycémie était plus fréquente chez les patients qui ne recevaient pas des soins fondés sur les lignes directrices. L'hypoglycémie n'était pas fréquente et ne semblait pas être plus fréquente dans le groupe qui respectait les lignes directrices, quoique le nombre était petit. Ces résultats peuvent apaiser la crainte des médecins en ce qui concerne la possibilité de provoquer une hypoglycémie lors d'une administration adéquate de l'insuline chez les patients hospitalisés.

© 2017 Canadian Diabetes Association.

Introduction

In patients with diabetes, in-hospital hyperglycemia is defined as any glucose value above 7.8 mmol/L (1). There is no clear evidence of specific blood glucose goals for noncritically ill patients. However, several current guidelines recommend preprandial blood glucose targets between 5.0 and 8.0 mmol/L and random blood glucose values below 10.0 mmol/L (1,2).

The prevalence of hyperglycemia in noncritically ill patients with diabetes is estimated to be about 26% and is associated with increased morbidity and mortality as well as prolonged hospital stays (3,4). Reasons for this high rate, in addition to the physiologic state, are related primarily to inadequate prescribing, monitoring and communication practices (5).

The *Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada* recommended continuing patients' prehospitalization oral antihyperglycemic agents or insulin regimens if their medical conditions, dietary intakes and glycemic control are acceptable. If patients were on insulin prehospitalization, "a proactive approach that includes basal, bolus and correction (supplemental) insulin, along with pattern management, should be used to reduce adverse events and improve glycemic control, instead of using reactive sliding scale alone." (2).

Our goals were to assess the level of adherence to the current Canadian guidelines for inpatient management of type 2 diabetes and whether it would result in a reduction in the number of hyperglycemic episodes (fasting capillary blood glucose measurement [CBGM] above 8.0 mmol/L or random blood glucose measurement above 10.0 mmol/L), hypoglycemic episodes (CBGM below 4 mmol/L), and to find whether there are any special characteristics predicting which patients receive guideline-based care.

Methods

This was a retrospective longitudinal study that was conducted in 2 academic teaching hospitals in Hamilton, Ontario. The study was approved by the local ethics board and conducted according to the Declaration of Helsinki.

Data were collected from October through December 2014 from patients admitted during 2 consecutive 4-week periods, 1 at each of 2 hospital sites. The study enrolled consecutive adult patients who were admitted to the internal medicine service (clinical teaching units) with type 2 diabetes and were treated with insulin and/or other antihyperglycemic drugs (i.e. not diet controlled) and who were not NPO according to their initial admission orders. Patients were excluded if they were admitted to the intensive care unit (ICU) or had admission diagnoses of hypoglycemia, hyperglycemic hyperosmolar state or diabetic ketoacidosis or were discharged from the hospital in fewer than 24 hours.

The sample was divided into groups that received guideline-adherent or guideline-nonadherent diabetes therapy according to their

initial admission orders' being consistent with the Canadian pharmacotherapy management guidelines described above. Specifically, patients were categorized into the adherent group if they were continued on prehospitalization medications (oral antihyperglycemic, insulin or both) or if they received, at minimum, basal intermediate-to long-acting insulin. Patients who were managed by withholding home antihyperglycemic therapy, and whose glycemic control was managed exclusively by using a reactive sliding scale alone, or no action was taken, were classified into the nonadherent group. No standardized order-set for diabetes management was used. Dosages of insulin were not assessed.

All CBGM readings for the first 3 days of admission were recorded, and any hyperglycemic (fasting capillary blood glucose >8.0 mmol/L or random blood glucose >10.0 mmol/L) or hypoglycemic (capillary blood sugar <4 mmol/L) episodes were noted. Admission diagnoses were categorized in a system-based pattern, and the severity of comorbidities was calculated using the Charlson morbidity index (6). Prehospitalization diabetes medications taken at home were categorized into oral hypoglycemics, insulin or a combination of both. The seniority of the person writing the initial admission orders was documented. Admission orders may be written by medical students, junior residents, senior residents or attending physicians, and all admissions by medical students and junior residents are reviewed by a senior resident and/or attending physician before implementation. Because of the structure of the service, attending physicians and senior residents admitted patients during the day, and senior residents or junior residents admitted patients at night, with supervision by senior residents.

Statistical analysis

For each participant, the proportion of hyperglycemia was calculated as the number of hyperglycemic CBGMs divided by the total number of CBGMs recorded for that participant during the observation period. The same was done for the proportion of hypoglycemia. The Student t test and the Fisher's exact test were used to compare covariates within the guideline-adherent and nonadherent groups. The mean age and mean number of CBGMs were compared using a t test. The proportions of other potential covariates (including admission diagnosis, Charlson score, type of medications at home and the admitting healthcare provider) were compared using the Fisher's exact test. For each statistical test, a p value <0.05 indicated significant difference between groups. All analyses were performed using Statistical Analysis Software v. 9.4 (SAS Institute, Cary, North Carolina, United States).

Results

A total of 150 patients with diabetes were admitted during the data-collection period, and 108 patients met the inclusion criteria.

Download English Version:

<https://daneshyari.com/en/article/8720782>

Download Persian Version:

<https://daneshyari.com/article/8720782>

[Daneshyari.com](https://daneshyari.com)