Evaluation of the effect of GLP-1 agonists on quality of bowel preparation for colonoscopy in patients with diabetes

Toishi Sharma1
MD
Nitin Das1
MD
Bahaaeldeen Ismail2
MD
Fernando Castro-Pavia2
MD
Jose Cabral1
MD
Carmen Villabona1
MD

1Department of Endocrinology, Cleveland Clinic, Weston, Florida, USA
2Department of Gastroenterology, Cleveland Clinic, Weston, Florida, USA

Correspondence to:
Dr Toishi Sharma, Department of Endocrinology, 2950 Cleveland Clinic Blvd, Weston, FL 33331, USA; email: sharmatoishi@gmail.com

Received: 13 February 2017
Accepted in revised form: 17 May 2017

Abstract
People with diabetes mellitus warrant a greater need for colonoscopy owing to the increased risk of colorectal cancer and autonomic neuropathy. Unfortunately, this population is reported to have a higher proportion of inadequate bowel preparation during colonoscopy, which translates into lower adenoma detection rates and repeat colonoscopies. Glucagon-like peptide-1 (GLP-1) agonists commonly used in the management of diabetes are well known to cause delayed gastrointestinal (GI) transit times, yet it is unknown if they contribute to the higher frequency of inadequate bowel preparation in people with diabetes.

Therefore, we conducted a retrospective medical record analysis of type 2 diabetic patients aged 45–75 who had an outpatient colonoscopy between 2012 and 2015. Our patients were taking either Byetta, Victoza or Bydureon and the method of bowel preparation used was polyethylene glycol electrolyte lavage solution. Patients who had a diagnosis of conditions known to cause delayed GI transit times (autonomic neuropathy, GI surgery, stroke and multiple sclerosis) were excluded. The final pool consisted of 126 diabetic patients taking a GLP-1 agonist and a control group of 129 diabetic patients who were not taking this class of medication. The percentage of satisfactory bowel preparations in the group taking a GLP-1 agonist was 92.06% and in the control group was 92.25%. Chi-squared p-value for significant difference between these two groups was p=1.0 (95% confidence interval -0.066 to 0.069). Hence there were no significant differences in bowel preparation among diabetic patients taking GLP-1 agonists vs the control group; GLP-1 agonists can therefore continually be used according to the current standard protocols for colonoscopy before and after colonoscopy. Copyright © 2017 John Wiley & Sons.

Key words
GLP-1 agonists; colonoscopy

Introduction
Diabetes mellitus is associated with a greater need for colonoscopy due to the increased risk of colorectal and rectal cancer1 as well as symptoms resulting from autonomic neuropathy. However, diabetes is also associated with a higher proportion of patients having inadequate bowel preparation at the time of colonoscopy.2–4 This translates to adverse consequences including lower adenoma detection rates, longer procedural time and repeat colonoscopies.5–9 As incretin-based therapies (GLP-1 agonists) commonly used in the management of diabetes are well known to cause delayed gastrointestinal (GI) transit times, our aim was to determine if this therapy plays a role in the increased frequency of inadequate bowel preparation for colonoscopy in diabetic patients.

Methods
We conducted a retrospective medical record analysis of type 2 diabetic patients aged 45–75 who had had an outpatient elective colonoscopy between 2012 and 2015. The indication for colonoscopy was routine screening and/or symptoms such as constipation, nausea or bloating. Our patients were taking one of the following drugs – Byetta, Victoza or Bydureon. The method of bowel preparation used was high-volume polyethylene glycol electrolyte lavage solution (PEG-ELS). PEG-ELS is an isotonic oral, non-digestible and non-absorbable solution. Four litres of PEG-ELS were administered to the patients 4–6 hours before the colonoscopy. In comparison to the other popular bowel preparation for elective colonoscopy that uses sodium phosphate (NaP), five out of six meta-analyses conducted between 1998 and 2012 found no adverse consequences including lower adenoma detection rates, longer procedural time and repeat colonoscopies.5–9 As incretin-based therapies (GLP-1 agonists) commonly used in the management of diabetes are well known to cause delayed gastrointestinal (GI) transit times, yet it is unknown if they contribute to the higher frequency of inadequate bowel preparation in people with diabetes.

Therefore, we conducted a retrospective medical record analysis of type 2 diabetic patients aged 45–75 who had an outpatient colonoscopy between 2012 and 2015. Our patients were taking either Byetta, Victoza or Bydureon and the method of bowel preparation used was polyethylene glycol electrolyte lavage solution. Patients who had a diagnosis of conditions known to cause delayed GI transit times (autonomic neuropathy, GI surgery, stroke and multiple sclerosis) were excluded. The final pool consisted of 126 diabetic patients taking a GLP-1 agonist and a control group of 129 diabetic patients who were not taking this class of medication. The percentage of satisfactory bowel preparations in the group taking a GLP-1 agonist was 92.06% and in the control group was 92.25%. Chi-squared p-value for significant difference between these two groups was p=1.0 (95% confidence interval -0.066 to 0.069). Hence there were no significant differences in bowel preparation among diabetic patients taking GLP-1 agonists vs the control group; GLP-1 agonists can therefore continually be used according to the current standard protocols for colonoscopy before and after colonoscopy. Copyright © 2017 John Wiley & Sons.

Key words
GLP-1 agonists; colonoscopy

Introduction
Diabetes mellitus is associated with a greater need for colonoscopy due to the increased risk of colorectal and rectal cancer1 as well as symptoms resulting from autonomic neuropathy. However, diabetes is also associated with a higher proportion of patients having inadequate bowel preparation at the time of colonoscopy.2–4 This translates to adverse consequences including lower adenoma detection rates, longer procedural time and repeat colonoscopies.5–9 As incretin-based therapies (GLP-1 agonists) commonly used in the management of diabetes are well known to cause delayed gastrointestinal (GI) transit times,9–11 our aim was to determine if this therapy plays a role in the increased frequency of inadequate bowel preparation for colonoscopy in diabetic patients.

Methods
We conducted a retrospective medical record analysis of type 2 diabetic patients aged 45–75 who had had an outpatient elective colonoscopy between 2012 and 2015. The indication for colonoscopy was routine screening and/or symptoms such as constipation, nausea or bloating. Our patients were taking one of the following drugs – Byetta, Victoza or Bydureon. The method of bowel preparation used was high-volume polyethylene glycol electrolyte lavage solution (PEG-ELS). PEG-ELS is an isotonic oral, non-digestible and non-absorbable solution. Four litres of PEG-ELS were administered to the patients 4–6 hours before the colonoscopy. In comparison to the other popular bowel preparation for elective colonoscopy that uses sodium phosphate (NaP), five out of six meta-analyses conducted between 1998 and 2012 found no
significant difference in quality of bowel preparation between PEG and NaP.12

 Patients who had a diagnosis of autonomic neuropathy, previous GI surgery and neurological conditions known to cause delayed GI transit times (stroke, multiple sclerosis) were excluded from the study. Based on our inclusion criteria, the final study pool consisted of 126 diabetic patients taking a GLP-1 agonist as part of their diabetes management and 129 diabetic patients who were not taking this class of medication (control group). We then conducted statistical analysis on our data using percentages and Chi-square test to determine any significant differences in the quality of bowel preparation among these groups.

Results
The percentage of satisfactory bowel preparations in the group taking a GLP-1 agonist was 92.06% and for the group not taking a GLP-1 agonist was 92.25%. Chi-squared p-value for significant difference between these two groups was p = 1.0 (95% confidence interval 0.066 to 0.069). Hence there were no significant differences in bowel preparation among diabetic patients taking a GLP-1 agonist vs the control group. All bowel preparations labelled as ‘fair’, ‘adequate’, ‘good’ or ‘excellent’ were considered to be satisfactory preparations. Preparations labelled either ‘inadequate’ or ‘poor’ were considered unsatisfactory.

Discussion
Individuals with diabetes have an approximately 30% increased relative risk of developing colorectal cancer compared with non-diabetic individuals. Regular screening with colonoscopy is therefore important in patients with diabetes. Moreover, these patients frequently suffer from GI symptoms such as constipation, hard stools, fecal urgency and incomplete evacuation, leading to a further increase in the number of colonoscopies performed in this population. However, unfortunately it has been observed that a high proportion of colonoscopies in diabetic patients are reported as unsatisfactory.13 Inadequate bowel preparations are associated with longer procedures, higher complication rates and missed pathologic lesions. Additionally, patients with an inadequate preparation may have cancelled or aborted colonoscopies leading to delayed and/or repeated examinations. Consequently, identification of predisposing factors is bound to have several positive outcomes related to these fields. As GLP-1 agonists are well known to cause delayed GI transit times they could arguably contribute to the increased number of inadequate bowel preparations in diabetic patients. However, in our study, we found no significant difference in the quality of bowel preparation between diabetic patients who were taking GLP-1 agonists and those who were not. GLP-1 agonists can therefore continually be used according to the current standard protocols for colonoscopy without concerns regarding their effect on GI transit times. All patients on a GLP-1 agonist prior to colonoscopy should be continued on the drug pre- and post-procedure.

Limitations
This result should be viewed in the light that the colonoscopies done at our hospital were found to have lower rates of inadequate bowel preparation (8%) overall when compared to statistics from other studies (9–20%).14–16 Also, we included only a PEG-based bowel preparation in our study.

Further studies are needed to determine additional risk factors in diabetic patients that could be contributing to the increased incidence of unsatisfactory bowel preparation in this population. Factors which could potentially influence the gastric motility – e.g. duration of diabetes, glycaemic control, and medications such as prokinetics and laxatives – were not accounted for in the study. In addition, the GLP-1 agonists were not categorised given their differential effect on the enteric neuronal system.

Declaration of interests
There are no conflicts of interest declared.

The study was carried out after approval from the Institutional Review Board committee and consent was obtained from all human subjects.

References