Sodium glucose co-transporter (SGLT2) inhibitors: risks in the perioperative period

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RESEARCH WEEK
5-9 OCTOBER 2020
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Background

- Sodium glucose co-transporter 2 (SGLT2) inhibitors are the latest addition of drug classes to treat hyperglycaemia in Type 2 diabetes mellitus (T2DM). They promote glycosuria which is a unique mechanism of action that sets it apart from other oral hypoglycaemic agents (1).
- New recent trials have shown protective cardiorenal benefits for these agents and therefore they are expected to be encountered more often by anaesthetists in the perioperative period (2).
- Current protocols at Northern Health dictate that these agents are ceased 72 hours prior to endoscopy. There is, however, no consensus on the timing of cessation of these agents with recommendations varying from 24-72 hours.
- We hypothesised that stopping SGLT2 inhibitors for 72 hours prior to endoscopy increases the risk of developing hyperglycaemia during the perioperative period.

Aims & Objectives

- To measure the incidence of hyperglycaemia in the perioperative period, comparing diabetics taking SGLT2 inhibitors and those on other oral hypoglycaemic agents.
- To assess the validity of current guidelines.
- To assess whether current guidelines are being adhered to.

Methods

- This was a prospective observational study conducted across both The Northern Hospital and the Broadmeadows Health Service.
- Included patients with Type 2 diabetes mellitus undergoing endoscopy. Excluded those that were not taking any medications for their diabetes (diet-controlled).
- Data was collected over a 6-week period in the preadmission and recovery area utilizing a data collection form.

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Results & Discussion

Table 1. Patient Population

Patient Characteristics	Overall	Control	SGLT2i	p-value
Count, n (%)	163 (100)	129 (79.1)	34 (20.9)	
Age (years)	66.9 +/- 10.8	67.2 +/- 11.5	66.0 +/- 7.8	
Male, n (%)	85 (52.1)	69 (53.5)	16 (47.1)	0.504
HbA1c %, (IQR)	7.2 (6.5 - 8.5)	7.2 (6.4 - 9.2)	7.5 (6.9 - 8.0)	
Type 2 Diabetes, n (%)	158 (96.9)	124 (96.1)	34 (100.0)	
Bowel Prep = yes, n (%)	118 (73.3)	92 (71.9)	26 (78.8)	0.424
eGFR >45mL/min/1.73m^2, n (%)	82 (78.8)	60 (74.1)	22 (95.6)	

Table 1 summarises the patient population as a complete sample and further subdivides the data into the two observed groups. The control group refers to diabetic patients that were on at least 1 oral hypoglycaemic agent other than an SGLT2 inhibitor.

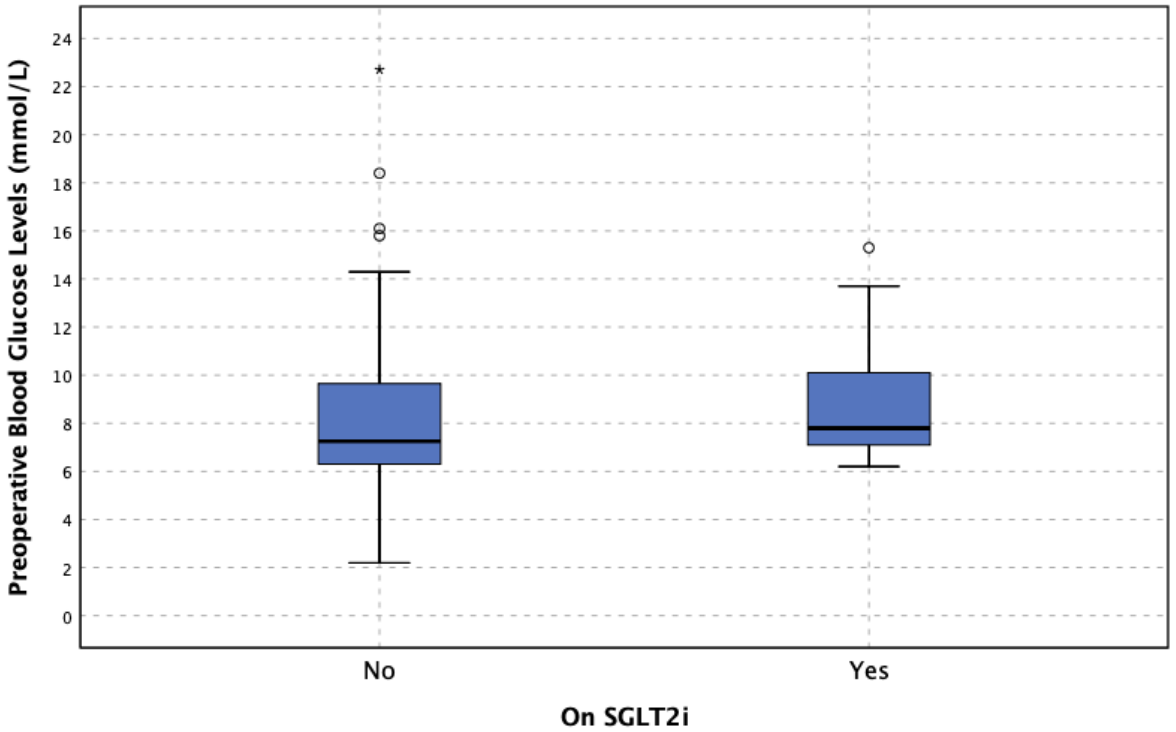

Figure 1. Preoperative blood glucose levels

Compares blood glucose levels at the time of admission between patients taking an SGTL2 inhibitor vs those that were not. Median blood sugar level for those not taking an SGLT2 inhibitor was 7.3 [Interquartile range (IQR) 6.3-9.6] compared to 7.8 (7.2 -10.1) for patients taking an SGLT2 inhibitor (p-value 0.079).

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Results & Discussion continued

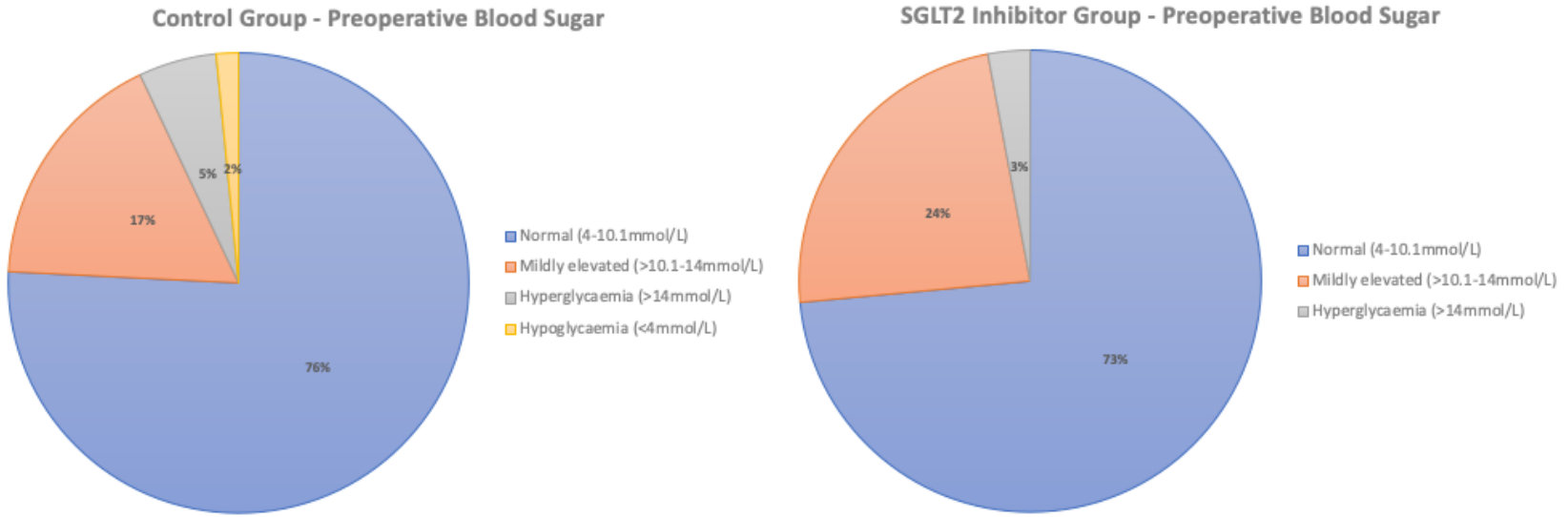

Figure 2 - Preoperative sugar status

The primary outcome was incidence of hyperglycaemia which was observed in 5% of patients in the control group vs 3% of patients in the SGLT2 inhibitor group; no significant difference (p-value 1.0).

Table 2 Audit of ketone measurements

Were ketones measured?	Control group	SGLT2i group
No, n (%)	20 (70.4)	7 (20.6)
Yes, n (%)	8 (28.6)	27 (79.4)

Blood ketones are indicated in the perioperative period for all diabetic patients taking an SGLT2 inhibitor or if blood sugar levels >10.1mmol/L. Table 2 shows that 20.6% of SGLT2 inhibitor patients and 70.4% of diabetic patients in the control group did not have their ketone levels measured when it was indicated.

Conclusion

- Patients ceasing their SGLT2 inhibitors for 72 hours as per protocols did not have higher rates of hyperglycaemia compared to patients on other oral hypoglycaemic agents suggesting that it is safe to continue following current guidelines. We recommend further studies with larger sample sizes to detect significant differences.
- Adherence to ketone measurements are poor, especially in diabetic patients not taking an SGLT2 inhibitor. Further education and training of hospital staff is required.

References

1. Peacock SC, Lovshin JA. Sodium-glucose cotransporter-2 inhibitors (SGLT-2i) in the perioperative setting. Canadian Journal of Anaesthesia. 2018;65(2):143-7.

2. Neal B, Perkovic V, Mahaffey KW, de Zeeuw D, Fulcher G, Erondu N, et al. Canagliflozin and Cardiovascular and Renal Events in Type 2 Diabetes. N Engl J Med. 2017;377(7):644-57.

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