Impact of sodium glucose cotransporter-2 inhibitors on post-operative atrial fibrillation in cardiothoracic surgery: A multicenter cohort study

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INTRODUCTION

- Sodium glucose cotransporter-2 (SGLT2) inhibitors are considered cornerstone therapy in patients with type 2 diabetes, chronic kidney disease, and heart failure, and were recently proposed to be protective against atrial fibrillation (AF).
- However, the impact of SGLT2 inhibitors on post-operative AF, which is a major concern after cardiothoracic surgery, has not yet been evaluated.
- Therefore, in this multicenter study, we assessed the effectiveness of SGLT2 inhibitors in preventing post-operative AF.

METHODS

- **Design**: multicenter retrospective observational cohort study
- **Setting**:
  - Heart Hospital, Main tertiary cardiology center in Qatar
  - Yale New Haven Health, Connecticut, USA
  - Rochester Regional Health, New York, USA
- **Population**:
  - All patients undergoing cardiothoracic surgery, over a 6-year period (1/06/2017-1/06/2023).
  - Patients receiving SGLT2 inhibitors for a minimum of one week prior to surgery were included in the SGLT2 inhibitor users arm
- **Groups:** (1) SGLT2i users; (2) SGLT2i non-users.
- **Outcomes:** The primary outcome was confirmed AF after surgery regardless of frequency, duration, or intervention used for cardioversion within 30 days of surgery.

METHODS – *cont.*

- **Statistical Analysis**:
  - Propensity score–matched model (1:1) was used to adjust for baseline demographics
  - Multivariate Cox proportional hazard regression analysis used to determine the primary outcome. P-value <0.05 indicated statistical significance.
- **Ethical approval:** HMC Medical Research Committee (MRC-01-23-470)

RESULTS

- We included 2240 patients who met the eligibility criteria (78% male, mean age 62±11).
- Using 1:1 propensity score matching for baseline demographics including age and gender, 1123 patients were included in the SGLT2 inhibitor users arm and 1117 were included in the non-SGLT2 inhibitor users arm with an absolute standardized difference <0.1.
- Around 79% of patients underwent CABG as shown in Table 1.

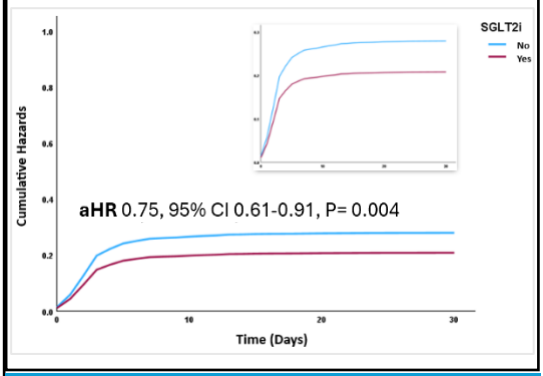
Table1. Baseline characteristics (N= 2240)

Characteristic	Frequency, n(%)
Male gender	1748 (78)
Age – years	63 ± 11
Body mass index – Kg/m²	29 ± 15
Comorbidities	
Hypertension	1828 (82)
Type II diabetes	1317 (59)
HFrEF	362 (16)
Chronic kidney disease	317 (14)
Cardiothoracic Surgery	
CABG	1768 (79)
AVR	336 (15)
MVR	41 (2)
TVR	4 (0.2)
Post-Operative Care	
Early beta-blocker initiation within 2 hours of stopping ionotropic therapy	314 (14)
Hypokalemia defined as less than 4.5 mmol/L in the first 12 hours post-surgery	1493 (67)
Hypomagnesemia defined as less than 0.8 mmol/L in the first 12 hours post-surgery	3 (0.1)
Pain control with opioids using patient-controlled analgesia	620 (28)

HFrEF: Heart failure with reduced ejection fraction; **CABG:** Coronary artery bypass graft; **AVR:** Aortic valve replacement; **MVR:** Mitral valve replacement; **TVR:** Tricuspid valve replacement

- The use of SGLT2 inhibitors was associated with a significant reduction of post-operative AF within 30 days of surgery as compared to SGLT2i non-users (aHR 0.75, 95% CI 0.61-0.91, P= 0.004).

Figure1. Cumulative hazards of AF associated with SLGT2i use



Conclusion

- Using real-world data, the use of SGLT2 inhibitors was found to be protective against post-operative AF, which may widen the spectrum of indications of SGLT2 inhibitors.

References

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