

Potential Association between SGLT2 Inhibitor Exposure and Development of Progressive Inflammatory Cystitis: A Case Series

Amrita Ladwa, BS¹; Jessica Qiu, BS¹; Jacqueline Zillioux, MD²
1. University of Virginia School of Medicine, 2. UVA Health



Background

- Progressive Inflammatory Cystitis (PIC)
 - Idiopathic subtype of “End Stage Bladder” (ESB)
 - Characterized by:
 - Chronic severe lower urinary tract symptoms
 - Cystoscopy with diffuse erythema/ulceration
 - Small capacity (<150 mL)
 - Upper tract changes
 - Absence of other cause (e.g., radiation, neurogenic)
 - Diagnosis
 - Cystoscopy with biopsy
 - Urodynamics
 - Management challenging, often requires urinary diversion
- Two patients presented to our clinic with ESB/PIC after exposure to a SGLT2-inhibitor**, a newer class of diabetes medication

Objective

- To identify other cases of ESB/PIC after SGLT2-inhibitor use

Methods

- Conducted a retrospective chart review to identify additional patients with SGLT2-inhibitor use and subsequent ESB/PIC
- We queried the EMR through TriNetX using ICD and CPT codes associated with ESB/PIC symptoms and associated procedures
- Filtered patients by diagnostic criteria (below)

ESB/PIC Patient Inclusion/Exclusion Criteria

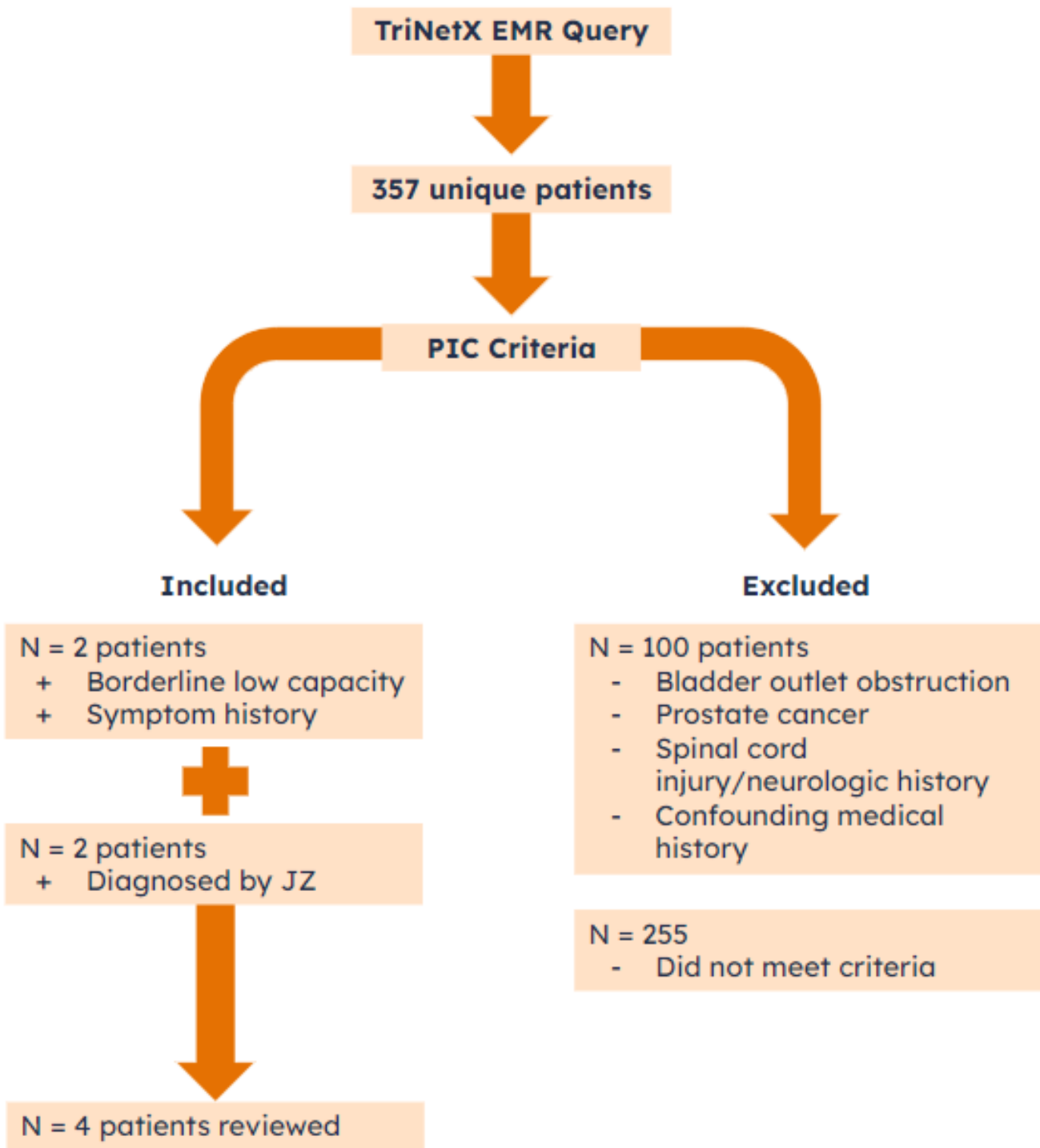
Inclusion (must meet at least two of three)

- 3+ months of urinary storage symptoms (urinary urgency, frequency, urgency urinary incontinence)
- Small cystometric capacity (≤150 mL)
- Reduced bladder compliance (≤30 mL/cmH₂O), vesicoureteral reflux, hydronephrosis, or chronic diffuse inflammatory cystitis changes on cystoscopy

Exclusion

- Urologic malignancy (e.g. prostate, bladder, renal cancer)
- Recent history of pelvic radiation therapy
- Bladder outlet obstruction
- End-stage renal disease with oliguria or anuria
- Congenital urologic anomaly
- Major abdominopelvic surgery (e.g. abdominoperineal resection)
- Interstitial cystitis with Hunner’s lesions

Patient Acquisition



















- 357 patients included in TriNetX query
- 2 patients met diagnostic criteria
- In total, 4 patients reviewed in this series

Results

Demographics

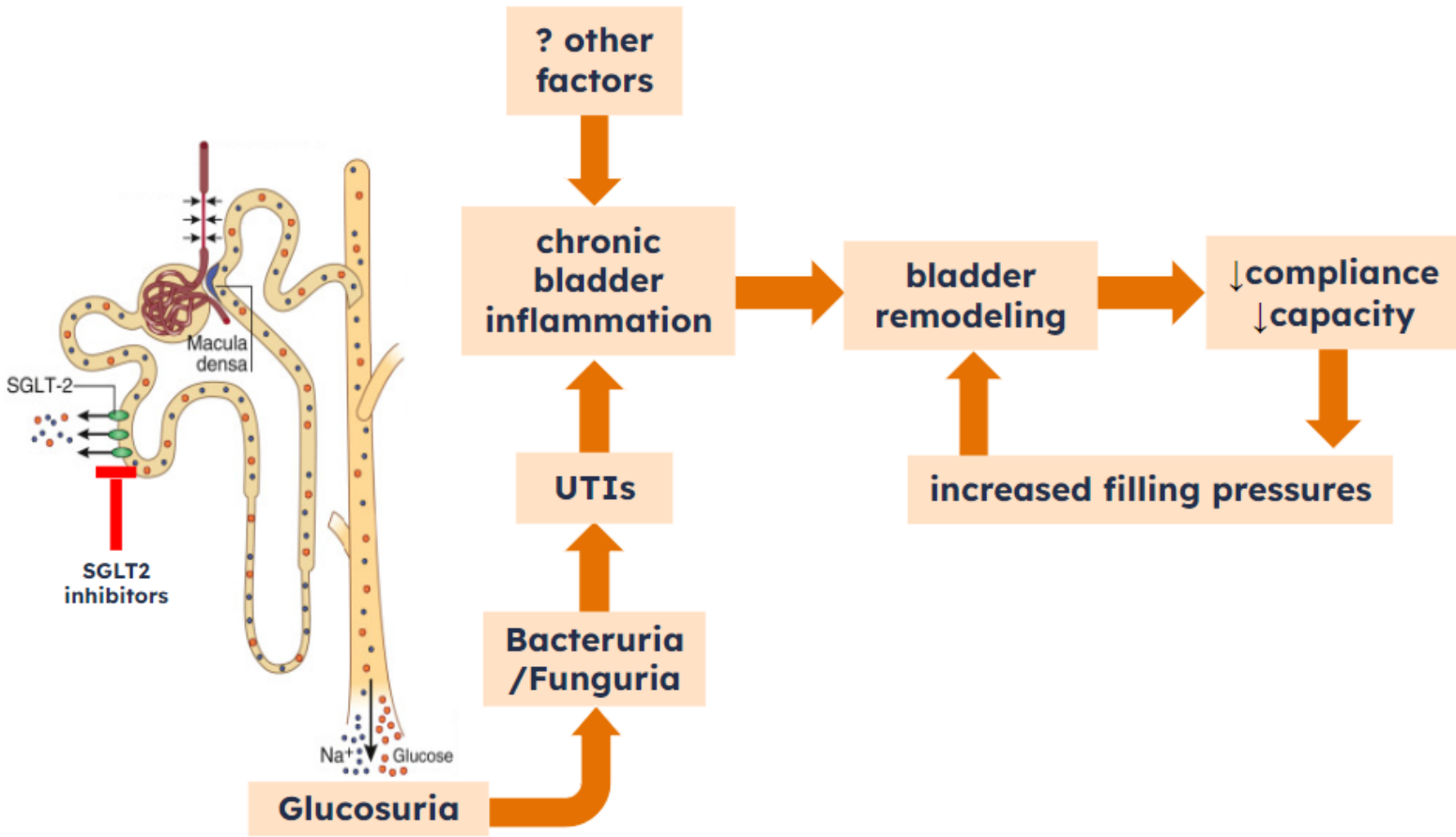
Patient	1	2	3	4
Sex	F	F	M	M
Age	53	64	72	35
Race	White	White	White	White
Ethnicity	Non-Hispanic	Non-Hispanic	Non-Hispanic	Non-Hispanic
BMI	36.4	25.8	23.9	17.9
Smoker	Former	Never	Never	Current
HTN	No	No	Yes	No
COPD	No	No	Yes	No
CAD	No	No	No	No
Diabetes	Yes	Yes	Yes	Yes
CKD	CKD3	None	CKD3	CKD3

Cohort Findings

	Patient 1	Patient 2	Patient 3	Patient 4
	54 YO F	74 YO F	72 YO M	35 YO M
SGLT2i use	 2 mo	 6 mo	 15 mo	 6 mo
Symptoms/ presentation	urgency frequency dysuria hematuria	sepsis of urinary origin bladder pain	urinary retention h/o frequency & urgency	urinary retention AKI penile/scrotal erythema
UTIs	 bacterial	 fungal		
workup	↓↓compliance ↓capacity VUR hydronephrosis	↓compliance ↓capacity VUR hydronephrosis	↓compliance ↓capacity	↓compliance ↓capacity VUR hydronephrosis
Suprapubic Tube				
Diversion				

Conclusions

Proposed Mechanism



- In a cohort of susceptible patients, SGLT2-inhibitors may contribute to the pathogenesis of ESB/PIC
- This series is limited as a small, retrospective, hypothesis-generating study

References

[1] Faris, A., Lane, G. I., Mehra, R., Dadhania, V., Crescenze, I., Clemens, J. Q., Romo, P. B., Stoffel, J., Malaeb, B., Blair, Y., Goh, M., Gupta, P., & Cameron, A. P. (2023). Destroyed bladders: Characterization of progressive inflammatory cystitis. *Neurourology and urodynamics*, 42(6), 1194–1202. <https://doi.org/10.1002/nau.25195>