#593 Diabetic Cystopathy:
Urodynamic Characterization in Female Patients

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Hypothesis / aims of study

Diabetic cystopathy (DC) is a frequent yet underestimated complication of diabetes mellitus, affecting the lower urinary tract, particularly the bladder. However, the current understanding of DC reflects a progressive condition with a wide range of clinical symptoms and urodynamic findings during its evolution. Changes in Detrusor muscle physiology may include alterations in intercellular connections, excitability, and distribution of muscarinic receptors, among others. Additionally, neuronal control of bladder function is compromised by diabetic neuropathy, affecting both autonomic and somatic pathways. On the other hand, urothelial abnormalities also play a significant role, altering the release of mediators and excitability in the bladder of diabetic patients.

The pathogenesis of DC may be related to prolonged hyperglycemia and oxidative stress, leading to metabolic changes and cellular damage, including apoptosis and neurodegeneration [1].

The first step is to suspect and find the pathology, to individualize treatment and achieve symptom relief while preserving the patient's renal function.

The main aim of the present study is to describe urodynamic characteristics in female diabetic patients attending functional urology consultations, specifically quantifying sensitivity, capacity, PdetQmax ratio, and post-void residual (PVR).

Table 1. Urodynamic Characteristics

Urodynamic variables	Minimum	Maximum	Mean	Standard Deviation
Bladder Capacity (mL)	286	869	592	176
Qmax (mL/s)	3	22	12	5
PdetQmax	10	41	19	8
Post-Void Residual ((mL)	20	560	188	161

Source: Data obtained during the study.
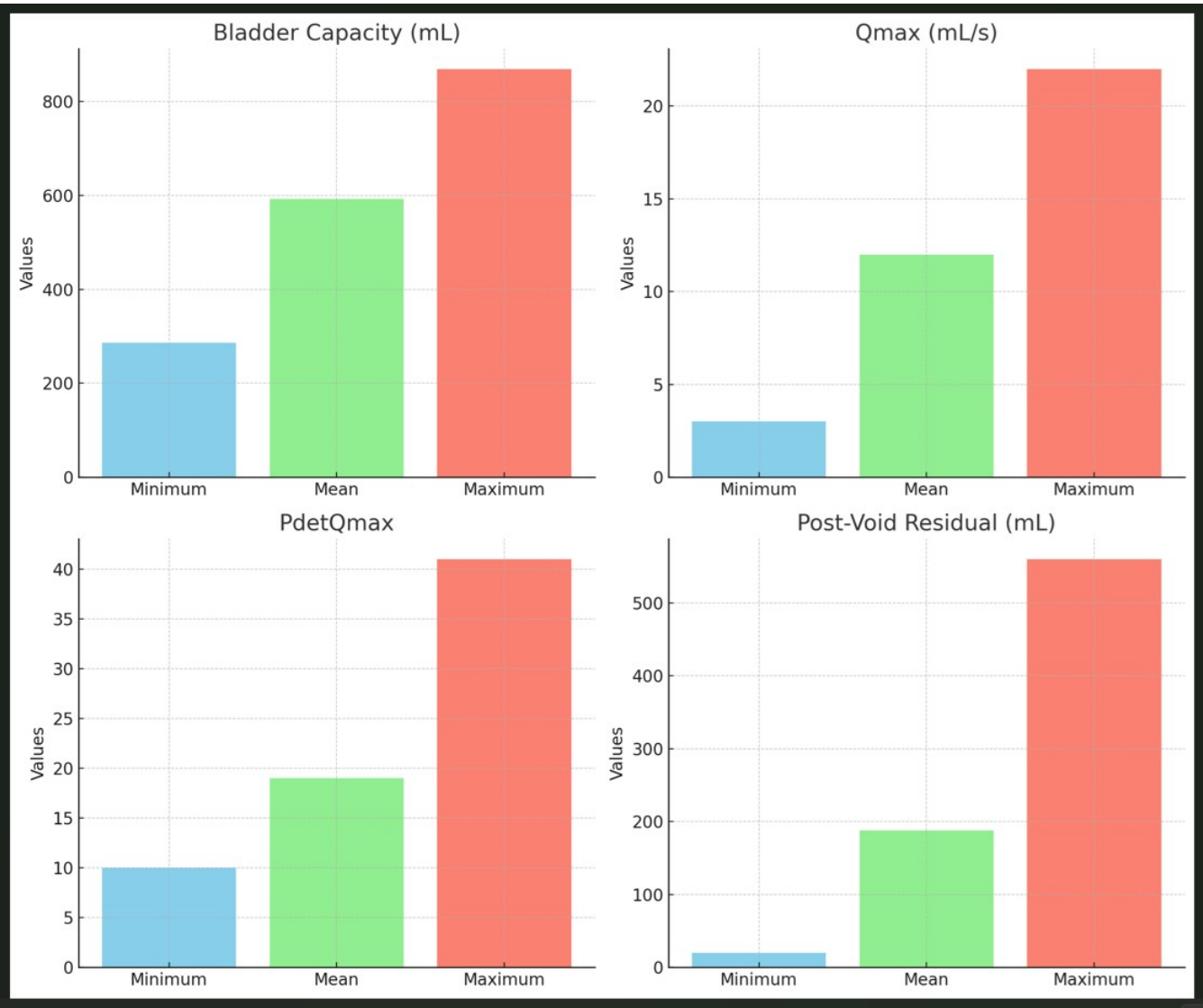
Study design, materials and methods

This is a clinical, retrospective, descriptive, and cross-sectional study. This design allows for the examination of urodynamic characteristics of diabetic cystopathy in female patients. While not establishing causal relationships, it offers a detailed insight into the condition at a specific time.

The population of interest will be female patients evaluated between January 2020 and December 2023 in the functional urology clinic, who meet the following criteria for sample selection.

Inclusion criteria:

Female patients aged between 35 and 75 years.

Confirmed diagnosis of type 2 diabetes mellitus with more than 5 years of progression.

Glycosylated hemoglobin < 6%.

Exclusion criteria:

Non-diabetic bacterial cystopathy.

Earlier treatment with pelvic radiotherapy.

Bladder capacity greater than 1500 ml in non-anesthesia cystometry.

History of bladder cancer.

Presence of urolithiasis.

Urodynamic studies will be conducted based on the International Continence Society's standards of good urodynamic practices. Patients will be adequately prepared, and a urine culture will be performed to rule out urinary tract infections. Cystometry, pressure-flow study, and post-void residual measurement by ultrasound will be conducted. The study will be concluded by removing the catheters and ending the urodynamic evaluation [2].

Descriptive measures such as mean and standard deviation for continuous variables, and frequencies and percentages for nominal variables will be calculated. Data analysis will be performed using SPSS 25.

Results and interpretation

The study results show that a total of 34 women with diabetes mellitus were evaluated, with a mean age of 66 ± 8 years (ranging from 46 to 74). The most common clinical manifestations were stress urinary incontinence (64.7%), decreased urinary stream (52.9%), sensation of incomplete emptying (29.4%), mixed urinary incontinence (17.6%), genital heaviness (11.8%), recurrent urinary tract infections (5.9%), nocturia (5.9%), and urgency (5.9%).

Regarding bladder sensitivity, the following indicators were seen: first sensation of filling 78 ± 66 mL (ranging from 18 to 262), first urge to void 324 ± 129 mL (ranging from 90 to 540), and strong urge to void 464 ± 151 mL (ranging from 180 to 749).

Regarding cystometry and pressure-flow study characteristics, bladder capacity was 592 ± 176 mL, with a mean Qmax value of 12 ± 5 mL/s, a PdetQmax ratio of 19 ± 8, and a PVR value of 188 ± 161 mL [Table 1].

In relation to other associated alterations, it was found that 52.9% of the patients had stress urinary incontinence. Anterior compartment pelvic floor defect was seen in 47.1% of the patients, with varying degrees of severity according to the POPQ classification, and urethral hypermobility was seen in 64.7% of the patients among other pathologies [Table 2]. Only 14.7% presented detrusor overactivity.

Our study revealed a high incidence of urological symptoms and altered urodynamic findings. These results offer a detailed insight into the clinical and urodynamic characteristics of diabetic cystopathy in women, contributing to a better understanding of this condition and potentially guiding the clinical management of patients. The urodynamic findings presented in our study are diverse and complex, often concurrent with other anatomical pathologies of the pelvic floor, which may worsen voiding dysfunction, impacting the patients' quality of life.

Table 2. Findings of Associated Pathologies

Pathologies	No	Yes	I	II	III
Stress Urinary Incontinence (SUI)	16 (47.1%)	-	12 (35.3%)	6 (17.6%)	-
Anterior Compartment Defect	18 (52.9%)	-	2 (5.9%)	12 (35.3%)	2 (5.9%)
Posterior Compartment Defect	18 (52.9%)	-	6 (17.6%)	8 (23.6%)	2 (5.9%)
Urethral Hypermobility	15 (44.1%)	19 (55.9%)	-	-	-
Apical Defect	28 (82.4%)	6 (17.6%)	-	-	-

Source: Data obtained during the study.
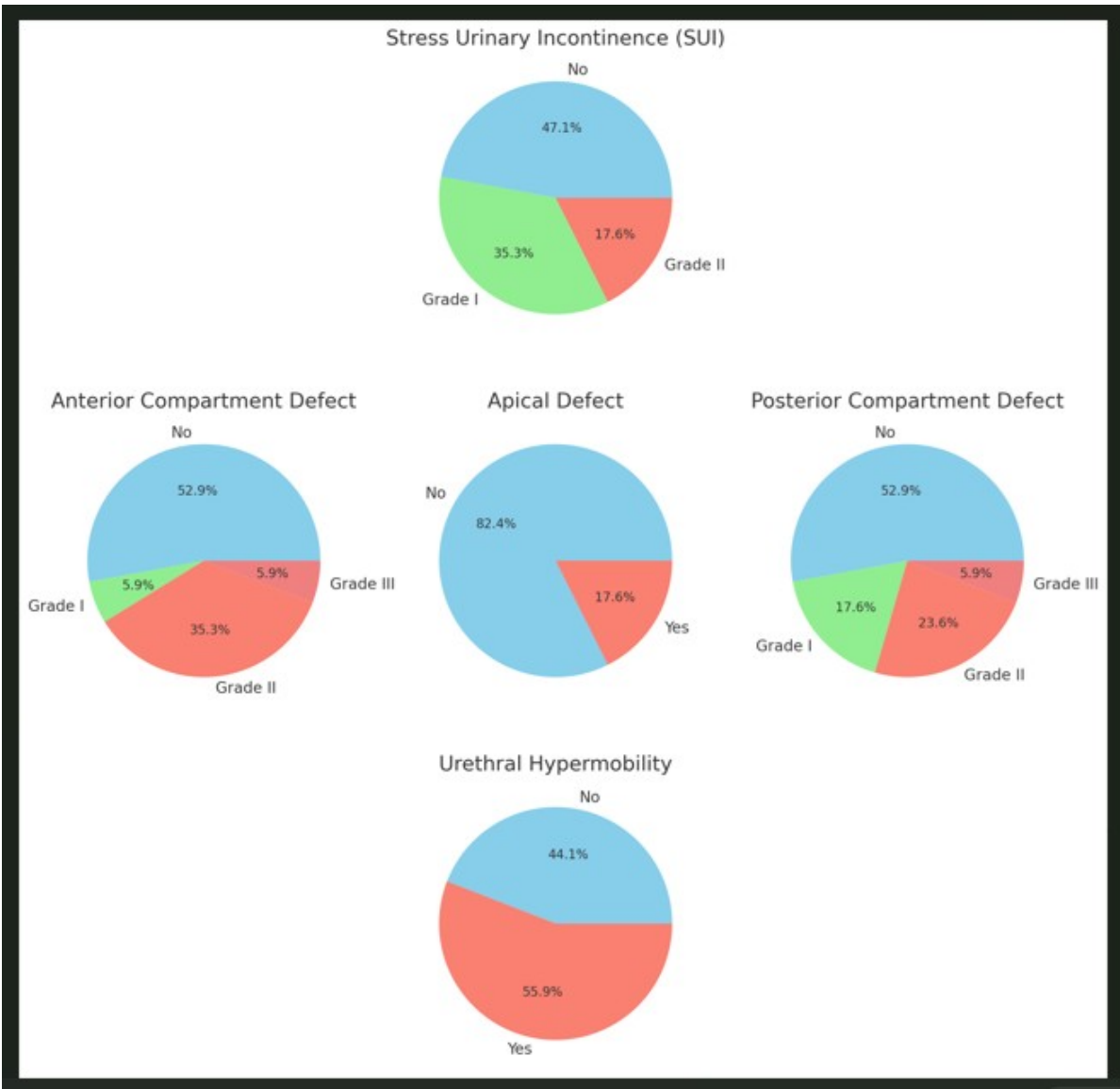
Conclusions

In conclusion, diabetic cystopathy presents as a complex and progressive condition, characterized by a variety of symptoms and identified urodynamic findings. These include decreased sensitivity, increased bladder capacity, decreased Qmax, and elevated post-void residual. Identifying these patterns is crucial for achieving effective management of diabetic cystopathy, improving the life of affected patients.

References

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