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Practice Patterns of Turkish Urologists Regarding Intravesical Botulinum Toxin-A Injections for Overactive Bladder and Neurogenic Lower Urinary Tract Dysfunction: A Survey Study

Türk Ürologlarının Aşırı Aktif Mesane ve Nörojenik Alt Üriner Sistem Disfonksiyonu İçin İntravezikal Botulinum Toksin-A Enjeksiyonlarına İlişkin Uygulama Yöntemleri: Anket Çalışması

Burhan COŞKUN[a], Ömer BAYRAK[b], Seniha ÇORABAY[c], Ahmet TAHRA[d], Ahmet KARAKEÇİ[e], Yunus ÇOLAKOĞLU[f], Yavuz Onur DANACIOĞLU[g], Kadir ÖNEM[h]

[a]Department of Urology, Bursa Uludağ University Faculty of Medicine, Bursa, Türkiye
[b]Department of Urology, Gaziantep University Faculty of Medicine, Gaziantep, Türkiye
[c]Department of Bioistatistics, Bursa Uludağ University Faculty of Medicine, Bursa, Türkiye
[d]Department of Urology, İstanbul Medeniyet University Faculty of Medicine, İstanbul, Türkiye
[e]Department of Urology, Fırat University Faculty of Medicine, Elazığ, Türkiye
[f]Department of Urology, University of Health Sciences Başakşehir Çam and Sakura City Hospital, İstanbul, Türkiye
[g]Department of Urology, University of Health Sciences Bakırköy Dr. Sadi Konuk Training and Research Hospital, İstanbul, Türkiye
[h]Department of Urology, Ondokuz Mayıs University Faculty of Medicine, Samsun, Türkiye

ABSTRACT Objective: We aimed to understand the practices of Turkish urologists using intravesical onabotulinum toxin-A (BoNT-A) injections for refractory overactive bladder (OAB) and neurogenic lower urinary tract dysfunction (NLUTD) treatment, focusing on pre, peri, and postoperative management. We also explored the potential influence of functional urology workload on these practices. **Material and Methods:** A cross-sectional survey was circulated via the Turkish Association of Urology's WhatsApp group, collecting data on practices and preferences related to BoNT-A treatment. Statistical analysis was performed for comparisons between categorical groups. **Results:** 65 urologists participated. Most targeted population was NLUTD patients (40%). Preoperatively, spinal or general anesthesia was the preferred method (55.4%). For perioperative prophylaxis, second-generation antibiotics were popular (43.1%). BoNT-A dosage typically was 100 units for first OAB application (92.3%), while 200 units for first NLUTD application (70.8%). The injection site was usually the detrusor (44.6%), with most refraining from trigone injections (63.1%). Respondents with the functional urology workload >25%, favored 300 units for the first NLUTD application (p=0.009), trigone injections (p<0.001), and a second application between 3-5 months (p=0.016). **Conclusion:** Significant variations have been identified in the usage of BoNT-A for the treatment of OAB and NLUTD by Turkish urologists, largely influenced by the functional urology workload. Understanding these differences will help refine treatment strategies and highlight the need for more research and more specific guidelines.

Keywords: Urinary bladder, overactive; urinary bladder, neurogenic; botulinum toxins, Type A; cross-sectional studies

ÖZET Amaç: Bu çalışmada, Türk ürologlarının dirençli aşırı aktif mesane (AAM) ve nörojenik alt üriner sistem disfonksiyonu (NAÜSD) tedavisinde intravezikal onabotulinum toksin-A (BoNT-A) enjeksiyonlarında pre, peri ve postoperatif yönetimindeki yönelimlerinin tespit edilmesi amaçlandı. Ayrıca, fonksiyonel üroloji iş yükünün bu uygulamalar üzerindeki potansiyel etkisi de araştırıldı. **Gereç ve Yöntemler:** Türk Üroloji Derneğinin WhatsApp grubu aracılığıyla, BoNT-A tedavisi ile ilgili uygulamalar ve tercihler hakkında veri toplayan kesitsel bir anket uygulandı. Kategorik gruplar arasındaki karşılaştırmalar için istatistiksel analiz yapıldı. **Bulgular:** Çalışmaya 65 ürolog katıldı. En çok hedeflenen popülasyon NAÜSD hastalarıydı (%40). Preoperatif olarak spinal veya genel anestezi tercih edilen yöntemdi (%55,4). Perioperatif profilaksi için en fazla tercih edilen ikinci kuşak antibiyotiklerdi (%43,1). BoNT-A dozajı tipik olarak ilk AAM uygulaması için 100 ünite (%92,3), ilk NAÜSD uygulaması için 200 ünite (%70,8) idi. Enjeksiyon bölgesi genellikle detrusordu (%44,6) ve katılımcıların çoğu trigon enjeksiyonundan (%63,1) kaçınıyordu. İş yükü >%25 olan katılımcılar, ilk NAÜSD uygulaması (p=0,009), trigon enjeksiyonları için (p<0,001) ve 3-5 ay arasında ikinci bir uygulama (p=0,016) için 300 üniteyi tercih ettiler. **Sonuç:** Türk ürologlar tarafından AAM ve NAÜSD tedavisi için BoNT-A kullanımında, büyük ölçüde fonksiyonel üroloji iş yükünden etkilenen, önemli farklılıklar belirlenmiştir. Bu farklılıkları anlamak, tedavi stratejilerini iyileştirecek ve daha fazla araştırmaya ve daha kesin kılavuzlara olan ihtiyacı vurgulayacaktır.

Anahtar Kelimeler: Mesane, aşırı aktif; mesane, nörojenik; botulinum toksinler, A tipi; kesitsel çalışmalar

Correspondence: Burhan COŞKUN
Department of Urology, Bursa Uludağ University Faculty of Medicine, Bursa, Türkiye
E-mail: burhanc@uludag.edu.tr

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Overactive bladder (OAB) and neurogenic lower urinary tract dysfunction (NLUTD) represent significant conditions that can substantially affect a patient's overall quality of life.[1,2] Over the past two decades, intravesical onabotulinum toxin-A (BoNT-A) injections have emerged as an effective, minimally invasive treatment for refractory OAB and NLUTD.[3,4] This technique has proven beneficial, particularly when conventional management strategies, such as anticholinergic medications or beta-3 adrenergic agonists, have not produced satisfactory outcomes.[3,5] Given its capacity to improve quality of life, BoNT-A injections have become a standard management strategy for refractory cases of OAB and NLUTD.[6]

However, notwithstanding the burgeoning acceptance of intravesical BoNT-A injections in the management of OAB and NLUTD, there exists a conspicuous absence of standardized guidelines governing their administration. This lack of consensus often results in variances in clinical practice related to preoperative preparation, perioperative tasks, and postoperative care and follow-up.[7,8] Preoperative practices can range from antibiotic prophylaxis to clean intermittent catheterization (CIC) trials, while perioperative considerations may encompass varying anesthesia techniques, dosages, and injection protocols.[7] Postoperative management might involve decisions about the timing of Foley catheter removal, antibiotic continuation, and follow-up evaluations, including the measurement of post-void residual urine (PVR).[9,10]

In Türkiye, the procedure of BoNT-A injections for refractory OAB and NLUTD is mainly performed in tertiary care hospitals and private facilities. However, a comprehensive analysis of current practices among Turkish urologists has not yet been conducted.

The primary aim of this study is to evaluate the practice patterns of intravesical BoNT-A injections among Turkish urologists, with a focus on preoperative, perioperative, and postoperative management. Additionally, this study aims to explore the potential influence of urologists' workload or dedication to functional urology on these practices.

MATERIAL AND METHODS

This study received approval from the Bursa Uludağ University Faculty of Medicine Clinical Research Ethics Committee (date: May 16, 2023, no: 2023-11/28). All the study process was carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. An informed consent was obtained from the participants. A cross-sectional survey was designed to collect data on Turkish urologists' clinical practices and preferences related to intravesical BoNT-A injections for managing refractory OAB and NLUTD. The questionnaire was disseminated through the Turkish Association of Urology's WhatsApp (Meta Platforms, Inc.,Menlo Park, USA) group, ensuring respondent anonymity and privacy protection.

The survey addressed various aspects of BoNT-A treatment, including clinical workload, patient groups, preoperative, perioperative, and postoperative considerations. The specific questions were as follows:

Clinical Workload and Patient Groups

1. What percentage of your clinical workload is devoted to functional urology and incontinence?
2. In which patient groups do you administer BoNT-A? (Multiple selections allowed)
3. Do you prefer using BoNT-A in patients aged 65 and above

Preoperative Considerations

1. Do you perform urodynamic testing prior to the procedure?
2. Which antibiotic do you prefer for preoperative prophylaxis?
3. Do you provide CIC education to patients during preoperative consultations?

Peroperative Considerations: Dosage and Injection Technique

1. Which anesthesia method do you use? (multiple selections allowed)
2. Which cystoscope do you use for the procedure?

3. Do you prefer using a needle with a stopper?
4. Which antibiotic do you prefer for perioperative prophylaxis?
5. How many units of BoNT-A do you use for the first application in OAB patients?
6. How many units of BoNT-A do you use for the first application in NLUTD patients?
7. How many cc of BoNT-A do you administer per injection for OAB patients?
8. How many cc of BoNT-A do you administer per injection for NLUTD patients?
9. How many injection sites do you use for OAB patients?
10. How many injection sites do you use for NLUTD patients?
11. Where do you administer the injections?
12. Do you perform injections in the trigone?
13. Do you insert a urethral catheter after the procedure?

Postoperative Considerations

1. If you use a urethral catheter, when do you remove it?
2. Which antibiotic do you use for postoperative prophylaxis?
3. What post-void residual threshold do you use for CIC?
4. When is the earliest you perform a second BoNT-A application?

Data from the completed surveys were systematically compiled and analyzed to identify practice patterns and potential influences of functional urology workload.

STATISTICAL ANALYSIS

The categorical variables in the study were expressed in numbers and their respective percentages. For comparisons between categorical groups, the chi-square and Fisher-Freeman-Halton tests were used. The analyses were performed using SPSS software (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.), with a type I error rate of 5% considered statistically significant.

RESULTS

A total of 65 urologists participated in this survey, elaborating their practice patterns in treating patients with OAB and NLUTD using BoNT-A. Regarding clinical workload and patient groups, it was found that functional urology represented 10-25% of the workload for most of the respondents (73.8%). In the administration of BoNT-A, it was found that the majority of practitioners primarily targeted patients suffering from NLUTD (40%). Additionally, 76.9% of the urologists favored the treatment of patients aged 65 and above with BoNT-A (Table 1).

The preoperative considerations demonstrated that 60% of urologists utilized urodynamic testing based on clinical necessity. Second-generation antibiotics were the preferred choice for preoperative prophylaxis, chosen by 41.5% of the respondents. Furthermore, during preoperative consultations, a risk narrative regarding CIC was provided by 72.3% of the urologists (Table 2).

In the preoperative phase, spinal or general anesthesia was the most favored method (55.4%). When considering tools, rigid cystoscopes were the preferred choice for a vast majority of respondents (93.8%). For perioperative prophylaxis, the majority opted for second-generation antibiotics (43.1%). As

TABLE 1: Clinical workload and patient groups.

	n	
Functional urology workload (%)		
10-25%	65	48 (73.8%)
≥25%		17 (26.2%)
BoNT-A administration patient groups		
OAB	65	16 (24.6%)
NLUTD		26 (40%)
Other		23 (35.4%)
BoNT-A preference in patients ≥65 year		
Yes	65	50 (76.9%)
No		15 (23.1%)

Data are given as n (%); n: Number of the patients; OAB: Overactive bladder; NLUTD: Neurogenic lower urinary tract dysfunction; BoNT-A: onabotulinum toxin-A.

TABLE 2: Preoperative considerations.

	n	
Urodynamic testing before the procedure		
Clinical necessity	65	39 (60%)
Each application		26 (40%)
Preoperative antibiotic preference		
Second generation	65	27 (41.5%)
Third generation		12 (18.5%)
Other		9 (13.8%)
None		17 (26.2%)
CIC education in preoperative consultation		
Yes	65	16 (24.6%)
No		2 (3.1%)
Risk narrative only		47 (72.3%)

Data are given as n (%); n: Number of the patients;
CIC: Clean intermittent catheterization.

for BoNT-A dosage, 100 units were typically administered for the first OAB application (92.3%), while 200 units were given for the first NLUTD application (70.8%). The location of injections primarily targeted the detrusor (44.6%), and most practitioners refrained from performing trigone injections (63.1%). Post-procedure, 81.5% of respondents placed a urethral catheter (Table 3).

Postoperative considerations highlighted that a 24-hour timeline was preferred by 52.8% of respondents for urethral catheter removal. Moreover, a large portion of practitioners did not administer antibiotics post-operatively (38.4%). It was also reported that a PVR threshold of 201-300 was most commonly set for CIC by the respondents (52.3%). As for the timing of a second BoNT-A application, it was largely favored to be between 6-8 months (66.2%) (Table 4).

Evidently, the functional urology workload appeared to influence practice patterns. Respondents with a workload greater than 25% were more likely to administer 300 units of BoNT-A for the first NLUTD application (p=0.009), more likely to perform trigone injections (p<0.001), and more likely to administer a second BoNT-A application between 3-5 months (p=0.016) (Table 5).

DISCUSSION

The findings of our survey emphasize the diverse clinical practices in administering intravesical BoNT-

TABLE 3: Peroperative considerations-dosage and injection technique.

	n	
Anesthesia method		
Local	65	10 (15.4%)
Sedation		19 (29.2%)
Spinal or general		36 (55.4%)
Cystoscope preference		
Rijid	65	61 (93.8%)
Flexibl		1 (1.5%)
Both		3 (4.6%)
Needle with stopper preference		
Yes	65	39 (60%)
No		26 (40%)
Perioperative antibiotic preference		
Second generation	65	28 (43.1%)
Third generation		16 (24.6%)
Other		6 (9.2%)
None		15 (23.1%)
BoNT-A units for first OAB application		
100	65	60 (92.3%)
200		5 (7.7%)
BoNT-A units for first NLUTD application		
100	65	14 (21.5%)
200		46 (70.8%)
300		5 (7.7%)
BoNT-A cc per injection for OAB		
0.5	65	27 (41.5%)
1		36 (55.4%)
Other		2 (3.1%)
BoNT-A cc per injection for NLUTD		
0.5	65	10 (15.4%)
1		53 (81.5%)
Other		2 (3.1%)
Injection sites for OAB		
10	65	19 (29.2%)
20		42 (64.6%)
30		4 (6.2%)
Injection sites for NLUTD		
10	65	8 (12.3%)
20		40 (61.5%)
30		17 (26.2%)
Injection location		
Detrusor	65	29 (44.6%)
Submucosal		12 (18.5%)
Both		24 (36.9%)
Trigone injections		
Yes	65	24 (36.9%)
No		41 (63.1%)
Urethral catheter after the procedure		
Yes	65	53 (81.5%)
No		12 (18.5%)

Data are given as n (%); n: Number of the patients; OAB: Overactive bladder;
NLUTD: Neurogenic lower urinary tract dysfunction; BoNT-A: onabotulinum toxin-A.

TABLE 4: Postoperative considerations.

	n	
Urethral catheter removal time (hour)		
6	53	7 (13.2%)
12		17 (32.1%)
24		28 (52.8%)
Other		1 (1.9%)
Postoperative antibiotic preference		
Second generation	65	18 (27.7%)
Third generation		15 (23.1%)
Other		7 (9.8%)
None		25 (38.4%)
PVR threshold for CIC (cc)		
100	65	3 (4.6%)
101-200		28 (43.1%)
201-300		34 (52.3%)
Earliest second BoNT-A application (month)		
3-5	65	5 (7.7%)
6-8		43 (66.2%)
9-11		14 (21.5%)
≥12		3 (4.6%)

Data are given as n (%); n: Number of the patients; PVR: Post-void residual urine; CIC: Clean intermittent catheterization; BoNT-A: Onabotulinum toxin-A.

A injections for managing OAB and NLUTD in Türkiye. The results indicate a noticeable absence of a standardized approach. This variability may be influenced by differences in practitioners' experience, patient specifics, and guidelines followed by different institutions. To the best of our knowledge, this is the first study from Türkiye, adding a contribution to the understanding of regional practice of intravesical bladder BoNT-A injections patterns. A similar lack of standardization was also reported in a recent survey study conducted in Canada.[11] This parallel suggests that the observed practice variability might be a global phenomenon rather than being restricted to specific regions.

The survey's finding that NLUTD was the most common indication for intravesical BoNT-A injections, closely followed by OAB. This prevalence could be attributed to the potentially severe symptoms of NLUTD, often requiring more aggressive management strategies.[12] Moreover, many patients with NLUTD may already be accustomed to CIC, possibly making them more receptive to this treatment modality. This existing familiarity with CIC could also mitigate some concerns about potential complications such as urinary retention, often associated with BoNT-A treatment.[10]

Patients with OAB generally present a lower risk of upper urinary tract deterioration, and therefore, urodynamic studies may not be required as part of their standard evaluation. However, for patients with NLUTD, the decision to perform urodynamic studies should be made on an individual basis, considering the specific clinical features and needs of the patient.[13] This approach aligns with the response of 60% of surveyed practitioners, who chose to conduct urodynamic studies based on clinical necessities rather than as a routine protocol.

The risk of urinary tract infections after BoNT-A injections is a valid clinical concern, thus warranting prophylactic measures. While there is no established consensus on the timing and duration of antibiotic prophylaxis, a recent study recommends a four-day course, initiated a day prior to the procedure.[14] Based on our survey, Turkish urologists use different antibiotic regimens. In the preoperative phase, 41.5% prefer second-generation cephalosporins, while 18.5% prefer third generation cephalosporins, 13.8% prefer other antibiotics, and 26.2% don't prefer any antibiotics. During the perioperative phase, 43.1% prefer second-generation cephalosporins, 24.6% prefer third generation cephalosporins, and 9.2% prefer other antibiotics. In the postoperative phase, 27.7% prefer second-generation cephalosporins, 23.1% prefer third generation a cephalosporins, 9.8% prefer other antibiotics, and 38.4% don't prefer any antibiotics.

The survey results suggest that the majority of participating urologists do not routinely provide preoperative CIC trail to their patients. This approach could be rooted in evidence from randomized controlled trials, which suggest that the likelihood of CIC necessity post-treatment is relatively low-at less than 5%.[15] Therefore, to prevent unnecessary patient anxiety, physicians may choose not to apply CIC prior to the operation.

While it's possible to perform intravesical BoNT-A injections under local anesthesia, our survey results indicate that the majority of respondents

TABLE 5: Comparison of practice patterns based on functional urology workload.

Variables	10-25% Workload (n=48)	>25% Workload (n=17)	p value
BoNT-A preference in patients ≥65 (year)			
Yes	35 (72.9%)	15 (88.2%)	0.317[a]
No	13 (27.1%)	2 (11.8%)	
Urodynamic testing before the procedure			
Clinical necessity	26 (54.2%)	13 (76.5%)	0.107[b]
Each application	22 (45.8%)	4 (23.5%)	
Preoperative antibiotic preference			
Second generation	20 (41.7%)	7 (41.2%)	0.092[a]
Third generation	11 (22.9%)	1 (5.9%)	
Other	8 (16.7%)	1 (5.9%)	
None	9 (18.8%)	8 (47.1%)	
CIC education in preoperative consultation			
Yes	12 (25.0%)	4 (23.5%)	>0.99[a]
No	2 (4.2%)	0	
Risk narrative only	34 (70.8%)	13 (76.5%)	
Anesthesia method			
Local	7 (14.6%)	3 (17.6%)	0.339[a]
Sedation	12 (25.0%)	7 (41.2%)	
Spinal or general	29 (60.4%)	7 (41.2%)	
Cystoscope preference			
Rijid	46 (95.8%)	15 (88.2%)	0.387[a]
Flexibl	1 (2.1%)	0	
Both	1 (2.1%)	2 (11.8%)	
Needle with stopper preference			
Yes	28 (58.3%)	11 (64.7%)	0.645[b]
No	20 (41.7%)	6 (35.3%)	
Perioperative antibiotic preference			
Second generation	19 (39.6%)	9 (52.9%)	0.793[a]
Third generation	13 (27.1%)	3 (17.6%)	
Other	5 (10.4%)	1 (5.9%)	
None	11 (22.9%)	4 (23.5%)	
BoNT-A units for first OAB application			
100	45 (93.8%)	15 (88.2%)	0.600[a]
200	3 (6.3%)	2 (11.8%)	
BoNT-A units for first NLUTD application			
100	13 (27.1%)	1 (5.9%)	0.009[a]
200	34 (70.8%)	12 (70.6%)	
300	1 (2.1%)	4 (23.5%)	
BoNT-A cc per injection for OAB			
0.5	21 (43.8%)	6 (35.3%)	0.767[a]
1	25 (52.1%)	11 (64.7%)	
Other	2 (4.1%)	0	
BoNT-A cc per injection for NLUTD			
0.5z	9 (18.8%)	1 (5.9%)	0.297[a]
1	38 (79.1%)	15 (88.2%)	
Other	1 (2.1%)	1 (5.9%)	
Injection sites for OAB			
10	15 (31.3%)	4 (23.5%)	0.893[a]
20	30 (62.4%)	12 (70.6%)	
30	3 (6.3%)	1 (5.9%)	

TABLE 5: Comparison of practice patterns based on functional urology workload *(continue)*.

Variables	10-25% Workload (n=48)	>25% Workload (n=17)	p value
Injection sites for NLUTD			
10	7 (14.6%)	1 (5.9%)	0.274[a]
20	31 (64.6%)	9 (52.9%)	
30	10 (20.8%)	7 (41.2%)	
Injection location			
Detrusor	24 (50.0%)	5 (29.4%)	0.093[b]
Submukozal	10 (20.8%)	2 (11.8%)	
Both	14 (29.2%)	10 (58.8%)	
Trigone injections			
Yes	11 (22.9%)	13 (76.5%)	<0.001[b]
No	37 (77.1%)	4 (23.5%)	
Urethral catheter after the procedure			
Yes	38 (79.2%)	15 (88.2%)	0.494[a]
No	10 (20.8%)	2 (11.8%)	
Urethral catheter removal time (hour)			
6	4 (10.5%)	3 (20%)	0.136[a]
12	11 (28.9%)	6 (40%)	
24	23 (60.6%)	5 (33.3%)	
Other	0	1 (6.7%)	
Postoperative antibiotic preference			
Second generation	13 (27.1%)	6 (35.3%)	>0.99[a]
Third generation	11 (22.9%)	5 (29.4%)	
Other	5 (10.4%)	2 (3.5%)	
None	19 (39.6%)	2 (11.8%)	
PVR threshold for CIC (cc)			
100	2 (4.2%)	1 (5.9%)	0.639[a]
101-200	22 (45.8%)	6 (35.3%)	
201-300	24 (50.0%)	10 (58.8%)	
Earliest second BoNT-A application (month)			
3-5	1 (2.1%)	4 (23.5%)	0.016[a]
6-8	32 (66.6%)	11 (64.7%)	
9-11	13 (27.1%)	1 (5.9%)	
≥12	2 (4.2%)	1 (5.9%)	

Define the variables was used to n (%); aFisher-Freeman-Halton test; bChi-square test; Data are given as n (%); n: Number of the patients; OAB: Overactive bladder; NLUTD: Neurogenic lower urinary tract dysfunction; BoNT-A: Onabotulinum toxin-A; CIC: Clean intermittent catheterization; PVR: Post-void residual urine.

favored the use of general or spinal anesthesia. This finding was particularly unexpected considering the potential for increased procedural risks and healthcare costs associated with these types of anesthesia. Similarly, rigid cystoscopy was favored over flexible options, a choice that might be influenced by several factors including practitioner comfort and training. Utilizing local anesthesia and flexible cystoscopy could potentially reduce procedural complications, enhance patient comfort and lead to overall cost-effectiveness.[16]

The application of needles with a stopper emerged as a preferred practice in our survey, indicating their perceived utility in the delivery of intravesical BoNT-A injections. The design features of these needles, particularly the stopper, can provide a practical benefit by helping to ensure a consistent injection depth, potentially leading to more accurate toxin placement and subsequently improved patient outcomes. Additionally, such precision could also mitigate potential complications associated with improper injection depth.[17]

The majority of randomized controlled trials and established guidelines suggest a dose of 100 IU for managing OAB, and this recommendation was mirrored in the survey responses.[15,18] For NLUTD, a dose of 200 IU was favored among the respondents, even though some studies propose the use of 300 IU.[19] Our survey data revealed that 70.8% of the respondents from the 10-25% workload group and 70.6% from the >25% workload group opted for a 200 IU dose for the first NLUTD application. A significantly smaller percentage chose the 300 IU dose, with 2.1% from the 10-25% workload group and 23.5% from the >25% workload group. The difference in preference for the 300 IU dose between the two workload groups was statistically significant (p=0.009).

The threshold for post-void residual urine volume that necessitates CIC often varies among medical practitioners, as our survey data clearly illustrates. From the respondents, 4.6% selected a PVR threshold of 100 mL, 43.1% opted for a threshold between 101-200 mL, while the majority, at 52.3%, favored a threshold between 201-300 mL. It's important to note that there isn't a universally accepted threshold for PVR, indicating that individual medical judgment significantly influences this decision.[20]

Despite the common recommendation of a 6-12 month interval between BoNT-A injections in most studies, our survey suggests this practice is more diverse in actual medical settings.[21] Some urologists even consider a repeat injection as early as three months. In terms of the earliest second application of BoNT-A, the survey of 65 urologists found that 7.7% preferred a timeline of 3-5 months. The majority, 66.2%, opted for an interval of 6-8 months. A smaller proportion, 21.5%, chose a 9-11 month gap, and only 4.6% would wait 12 months or more before reapplication.

Despite the valuable insights this study provides, some limitations warrant consideration. One limitation is the inherent risk of recall bias associated with self-reported data. Urologists could unintentionally misrepresent their practices or preferences, potentially impacting the accuracy of our findings. Additionally, the lack of a reported response rate means the responses collected may not fully represent all viewpoints, leading to potential nonresponse bias. The perspectives shared might not accurately capture the practices and attitudes across the whole spectrum of urologists.

CONCLUSION

In conclusion, our survey reveals significant variations in the practices of urologists treating OAB and NLUTD with BoNT-A, notably influenced by workload. For instance, urologists handling a workload above 25% were more inclined to consider earlier reapplication of BoNT-A and showed a stronger preference for trigonal injections. In terms of NLUTD treatment, a 200-unit standard dose was favored by most, but a higher dose of 300 units was considered by a sizeable segment of urologists with higher workloads.

These findings, specific to Turkish urologists, shed light on the diversity of global practices and underscore the necessity of further research and more definitive guidelines. Recognizing these variations and comprehending their implications on patient outcomes is paramount to refining future strategies for more effective management of OAB and NLUTD.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Burhan Coşkun, Ömer Bayrak;* ***Design:*** *Burhan Coşkun, Seniha Çorabay;* ***Control/Supervision:*** *Ömer Bayrak, Kadir Önem;* ***Data Collection and/or Processing:*** *Burhan Coşkun, Yavuz Onur Danacıoğlu, Yunus Çolakoğlu;* ***Analysis and/or Interpretation:*** *Burhan Coşkun, Seniha Çorabay, Ahmet Tahra;* ***Literature Review:*** *Ömer Bayrak, Ahmet Tahra, Yavuz Onur Danacıoğlu, Yunus Çolakoğlu;* ***Writing the Article:*** *Burhan Coşkun;* ***Critical Review:*** *Ömer Bayrak, Kadir Önem;* ***References and Fundings:*** *Burhan Coşkun, Ahmet Tarhan, Ahmet Karakeçi;* ***Materials:*** *Ömer Bayrak.*

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