

Comparing the effectiveness of intravesical botulinum toxin A injection by submucosal and intradetrusor muscle methods in patients with overactive bladder

Zargham M, Kazemi R, Safari M, Feizi A, Shabanpoor Z

Isfahan university of medical science

Presenter: Dr. Maede Safari

Email: Safari.maede@yahoo.com

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Background:

Overactive bladder (OAB) is characterized by urinary urgency, often accompanied by frequency and nocturia, with or without UII. For patients with refractory OAB who do not respond adequately to conventional therapies, intravesical injection of BTX-A has emerged as an effective treatment option. Various injection techniques, including submucosal and intradetrusor approaches, are utilized based on patient-specific factors and comorbidities. The present study aimed to evaluate and compare the therapeutic efficacy of submucosal versus intra-detrusor BTX-A injection in patients with overactive bladder.

Table 1. Descriptive statistics

Variable	Status	Intra-detrusor group	Submucosal group	P value
Age (year)		58.4 ± 14.2	57.5 ± 14.3	0.968*
Body mass index (kg/m ²)		30.0 ± 5.4	28.0 ± 3.9	0.073*
Duration of symptoms (month)		6.1 ± 5.5	9.5 ± 11.5	0.081*
Marriage status	Single	1	2	0.555 [†]
	Married	34	33	
Menopause	Yes	27	26	0.780 [†]
	No	8	9	
Type of delivery	Cesarean section	5	7	0.526 [†]
	Vaginal	30	28	
Previous treatment	Medications	13	20	0.240 [†]
	Physiotherapy	8	6	
	Surgery	14	9	
Urinary tract infection	Yes	18	19	0.811 [†]
	No	17	16	
Trabeculation status	None	12	15	0.638 [†]
	Mild	5	7	
	Moderate	14	11	
	Severe	4	2	

* Using independent t test

Method:

This study was conducted in Isfahan, Iran, during 2023–2024, and included patients presenting with urinary incontinence. Prior to intervention, all participants completed the validated Persian version of the ICIQ-LF. Patients were then allocated to receive intravesical injection of 500 mg botulinum toxin A (BTX-A) using either the submucosal or intradetrusor technique, depending on group assignment. Post-intervention assessments were performed at one and three months, during which participants again completed the ICIQ-LF questionnaire to evaluate changes in symptom severity and treatment outcome.

Results:

The findings of this study demonstrated no statistically significant differences in treatment outcomes between the intradetrusor and submucosal injection groups. Baseline characteristics, including age, body mass index (BMI), duration of symptoms, and other demographic and clinical variables, were comparable between the two groups. Following BTX-A injection, ICIQ-LF scores significantly decreased in both groups, reflecting an improvement in urinary symptoms and overall quality of life. Although submucosal injection method showed greater effectiveness, longitudinal analysis revealed no statistically significant differences in the efficacy of the two injection techniques at one- and three-month follow-up assessments.

Table 2. Comparison of ICIQ-LF scores between two groups before injection and one and three months after injection

Type of injection	ICIQ-LF score before injection	ICIQ-LF score one month after injection	ICIQ-LF score three month after injection	P value
Intradetrusor	48.8 ± 7.5	32.8 ± 10.6	34.2 ± 10.7	0.838*
Submucosal	50.6 ± 6.9	36.0 ± 11.2	36.9 ± 11.2	

* Using repeated measures ANOVA test

Implication:

Both submucosal and intradetrusor injection techniques were effective in significantly reducing the impact of urinary incontinence on patients' quality of life, as evidenced by the considerable decrease in ICIQ-LF scores following treatment. These findings suggest that both methods are comparably efficacious, and the choice of technique may therefore be tailored according to patient preference, clinical condition, and physician expertise.