

An explorative analysis of the effect of a beta 3 adrenoreceptor agonist (Mirabegron) on urethral pressure variations during filling cystometry

Hypothesis / aims study

Urethral instability (URI) has in the past been defined by the International Continence Society (ICS) but was abandoned because of lack of consensus in clinical studies. Recently, interest for URI and its possible role in OAB increased again. In the last decade, a beta 3 adrenoreceptor agonist (mirabegron) is approved for treatment of OAB. The effect of a mirabegron on urethral pressure during filling cystometry is unknown. The aim of this study was to assess the influence of mirabegron on urethral pressure variations during urodynamic investigation and the association of symptoms and voiding diary data before and on treatment.

Study design, material and methods

This prospective study included 51 consecutive adult female patients, referred with OAB. Patients were evaluated with a voiding diary, two validated questionnaires and urodynamic investigation, before and after six weeks of mirabegron. Urethral instability (URI) was defined as an urethral pressure drop exceeding 30 cmH₂O.

Results

	Before mirabegron	After mirabegron	P-value
Detrusor overactivity	9/42	10/42	0,317
Urethral instability	14/42	5/42	0,021
DO + URI	2/42	2/42	0,260
Wilcoxon test for paired samples, p < 0.05 is significant			

Domain	Before mirabegron (n=17)	After mirabegron (n=17)	P-value
IIQ-7 Q1	1.18	0.47	0.026
IIQ-7 Q2	1.71	1.00	0.012
UDI 6 Q3	1.12	0.75	0.034
UDI 6 Q4	1.76	1.13	0.015
Wilcoxon test for paired samples, p < 0.05 is significant			

	Before mirabegron (n=15)	After mirabegron (n=15)	P-value
Bladder capacity (ml)	339.50 (130-662)	392 (161-661)	0.087
Residue (ml)	7.50 (0-307)	15 (0-421)	0.722
First desire (cm H₂O)	70.50 (16-258)	208 (32-372)	0.005
Normal desire (cm H₂O)	181.50 (58-456)	297.50 (97-450)	0.010
Strong desire (cm H₂O)	320.50 (131-580)	379 (159-620)	0.046
Qmax (ml/s)	9.7 (1.9-341)	14.8 (7.7-40.5)	0.272
Qav (ml/s)	5.0 (2.9-188)	6.05 (0.3-21.5)	0.46
Max. urethral pressure (cm H₂O)	95 (75-130)	90 (40-143)	0.099
Min. urethral pressure (cm H₂O)	50 (26-110)	57.0 (16-101)	0.196
Urethral pressure difference (cm H₂O)	39.5 (8-95)	25 (8-46)	0.010
Wilcoxon test for paired samples, p < 0.05 is significant			

Interpretation of results

Prevalence of URI was in 31% at initial urodynamic investigation, and in 19% at second investigation. URI is more common than DO. Treatment with mirabegron resulted insignificant changes in symptoms and urodynamics in patients with URI.

Concluding message

The prevalence of URI within OAB patients more frequently than DO. Taken into consideration the amount of studies performed to the effect and influence of different treatment modalities on detrusor overactivity in patients suffering from OAB, these results confirm the need for future research to the role of urethral function within OAB.