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EFFECTS OF L-DOPA ON URODYNAMIC FINDINGS IN PARKINSON'S DISEASE PATIENTS: ACUTE VS. CHRONIC ADMINISTRATION

Hypothesis / aims of study

Several studies on the urodynamic effects of L-DOPA (LD) on lower urinary tract (LUT) behavior in Parkinson's disease (PD) patients have been published. Unfortunately, these studies show divergent results, with some of them affirming that LD reduces the severity of detrusor overactivity (DO) (1), while others found the opposite (2). Aim of our study was to compare the effects of LD on urodynamic findings in PD patients, after acute and chronic administration.

Study design, materials and methods

13 patients (5 females, 8 males), after signing an informed consent, were evaluated. Mean age was 61± 7.32 years. All patients were affected by idiopathic PD according with the Brain Banck Criteria (3) with an Hohen and Yahr score lower than 2.5 and a mean disease duration of 3.5 ± 1.3 years. UPDRS(section III) mean score in off condition was 32.34 ± 3.6. All subjects presented with overactive bladder symptoms. Patients were evaluated with urodynamic studies performed in three conditions: in off status (therapy withdrawal since at least 4-5 days if treated with LD agonists or 21 days if treated with LD); 45 minutes after oral administration of 250 mg of LD to evaluate patients during the drug "best on" (acute administration, LD acute); after one month of treatment with LD (mean daily dose 557± 158 mg) (chronic administration, LD chronic). No patient was assuming drugs with effects on LUT. Urodynamic evaluation was constituted by a cystometry followed by a pressure/flow study with perineal floor EMG. The following urodynamic parameters were evaluated: first sensation of bladder filling, detrusor neurogenic overactive contractions (DNOC) threshold and amplitude, bladder capacity, maximum flow (Qmax), detrusor pressure at maximum flow (Pdet@Qmax), post-void residual urine, presence of detrusor/sphincter pseudodyssynergia (DSPD). Results obtained in the three previously specified conditions were collected and statistically compared by means of ANOVA test and post-hoc Tukey test.

Results

Results are reported in table.

	Mean (SD)			Mean (SD)	
Pats.=13	Off status	LD Acute	p+	LD Chronic	P*
First sensation (ml)	130 (55)	110 (75)	ns	241 (94)	**<0.01**
DNOC threshold (ml)	255 (140)	168 (104)	=0.07	307 (138)	ns
DNOC amplitude (cmH2O)	66 (39)	76 (41)	=0.07	55 (34)	**=0.03**
Bladder capacity (ml)	347 (125)	269 (105)	**=0.02**	360 (126)	ns
Q max (ml/s)	17 (9)	17 (6)	ns	16 (6)	ns
Pdet@Qmax (cmH2O)	38 (19)	48 (28)	ns	41 (20)	ns
Residual urine (ml)	11 (21)	7 (5)	ns	13 (28)	Ns
DSPD (y/n)	2/11	2/11	-	2/11	-

Legend: +LD Acute vs. Off status; * LD Chronic vs. Off status.

Interpretation of results

According to our findings, acute LD administration seems to produce a worsening of neurogenic detrusor overactivity, with a significant decrease of bladder capacity and a (not significant) worsening of DNOC threshold and amplitude; on the other hand, chronic LD administration does not affect bladder capacity, but seems to provoke an improvement of some urodynamic parameters of the filling phase (first sensation, DNOC amplitude). No clear effect of LD administration could be demonstrated on voiding phase parameters.

Concluding message

The controversial data present in the literature could be due to different ways of LD administration (and/or of pre-evaluation drug withdrawal). It is interesting to observe that, if LD acute administration seems to worsen neurogenic detrusor overactivity of PD patients, its chronic administration produces an improvement of some urodynamic parameters: this finding could explain the clinical benefit on urinary symptoms often reported by the patients during chronic treatment.

References

1) Neurourol Urodyn, 12: 203-209, 1993.
2) Neurourol Urodyn, 19: 540, 2000
3) J Neural transmission, 39 (Suppl): 165-172, 1993.