247

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THE EFFECTS OF A1A ADRENOCEPTOR INHIBITORS ON THE URETHRAL PERFUSION PRESSURE OF FEMALE RAT

Hypothesis / aims of study

α1A-adrenoceptor blocker may play an important role in the treatment of functional bladder outlet obstruction(BOO) in female. However detailed examinations of in vivo study have rarely been undertaken. This study is performed to identify the effects of selective α1A-blocker on the urethral perfusion pressure (UPP) and also to assess its therapeutic potentials for female BOO.

Study design, materials and method

Under urethane anesthesia (20%, 0.5ml/100gm, I.P.), In each animal a cannula(PE-50) was placed in the femoral artery for drug administration. Bladder and proximal urethra were exposed through a midline abdominal incision. UPP and vesical pressure (Pves) were monitored using a triple-lumen catheter, which was introduced transvesically through a separate incision in the bladder dome and then seated securely in the bladder neck. Tamsulosin (Group I), doxazosin(Group II) and phentolamin(Group III) was injected in female rat. Tamsulosin was also injected to male rat (Group IV) for the comparison of Group I.

Results

After tamsulosin administration (group I), frequency was significantly decreased and the duration of bladder contraction and urethral relaxation with high frequency oscillations were significantly prolonged (fig.1, table 1). There were no significant differences of the parameters among different female rat groups. In male rat (group IV), UPP, and Pves changes were similar to that of female rat except significantly high in maximal Pves. After administration of 0.1 ml tamsulosin (10^{-7} M), the frequency was significantly decreased and the duration of bladder contraction and urethral relaxation with high frequency oscillations were significantly prolonged in male rat.

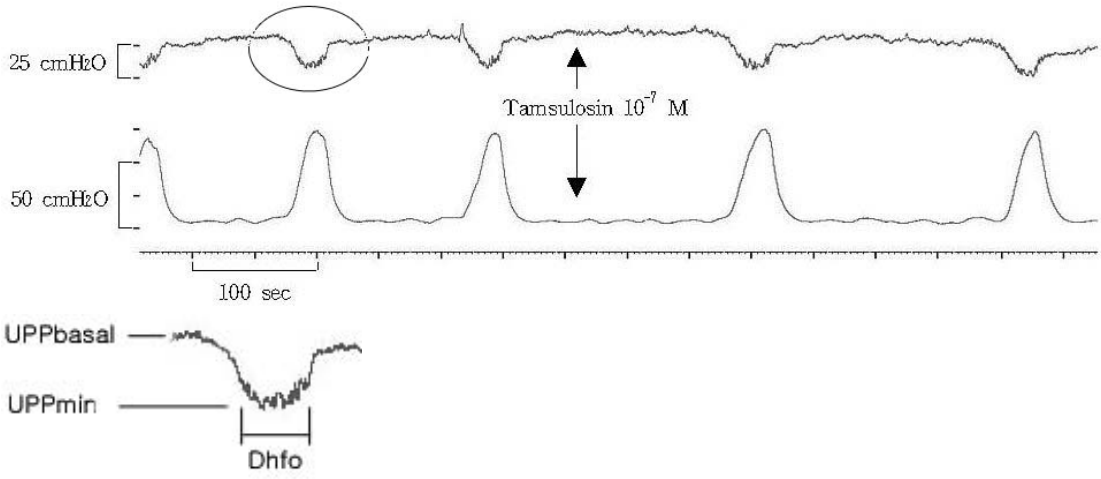

Fig.1. UPP and Pves changes after tamsulosin administration in female rat (Group I)

Table.1. Changes of parameters before and after tamsulosin administration in female rat

	Before	After	Differences	p-value
Frequency (/min)	0.44±0.23	0.32±0.18	-29.5%	p<0.01**
UPPbasal (cmH_2O)	28.4±4.0	27.1±4.7	-4.5%	p>0.05
UPPmin (cmH_2O)	8.2±3.2	8.0±2.5	-2.5%	p>0.05
Dhfo (sec.)	33±6	44±8	-34%	p<0.01**
Pvesdif (cmH_2O)	54.4±12.2	51.9±13.5	-5.8%	p>0.05
MAP (cmH_2O)	133±10.2	130±11.6	-2.3%	p>0.05

UPPbasal, baseline urethral perfusion pressure during contraction
UPPmin, minimal urethral perfusion pressure during relaxation
Dhfo, duration of high frequency oscillation
Pvesdif, vesical pressure change between peak and baseline pressure
MAP, mean arterial pressure
**, statistically significant

Interpretation of results

In female rat urethra, α1A adrenoceptor may be functional subtype. α1A blocker may prolong the duration of high frequency oscillation and decrease frequency of involuntary bladder contraction.

Concluding message

It might be possible that α1A blocker improves not only obstructive symptoms but also bladder irritative symptoms, by prolonging the duration of high frequency oscillation and frequency of involuntary bladder contraction.