

ACETYLCHOLINE RELEASE IN RAT URINARY BLADDER AFTER PARTIAL OUTLET OBSTRUCTION

Aims of Study

It has been reported that partial bladder outlet obstruction leads to hypertrophy and alteration in contraction of the detrusor smooth muscle. Acetylcholine has been known to play an important role in contraction of urinary bladder. However, there is about acetylcholine release after partial bladder outlet obstruction. Therefore, we investigated the changes of acetylcholine released from bladders of rats with partial bladder outlet obstruction.

Methods

Adult female rats had their bladder outlet partially obstructed by ligating the proximal urethra over 1mm angiocatheter; Sham operated rats served as controls. Rats were sacrificed 2 weeks, 3 months and 6 months after introducing bladder outlet obstruction. S. We have investigated the contractions induced by carbachol, KCl (80 mM) and electrical field stimulation (s.5 - 40) with electrical field stimulation, we collected the dialysate obtained from microdialysis probe inserted into the muscle strips during electrical field stimulation, and measured the amount of acetylcholine in the dialysate fraction by high performance liquid chromatography with electro-chemical detection.

Results

The rat bladder weight gradually increased after partial bladder outlet obstruction. There was not significant changes in KCl-induced contraction through the experimental period in both groups. Carbachol-induced contraction did not show significant changes until 3 months after bladder outlet obstruction, however there was a significant reduction at 6 months. Electrical field stimulation induced contractions were gradually reduced after partial bladder outlet obstruction. Acetylcholine release from bladder strip was not significantly different among groups until 2 weeks after bladder outlet obstruction. However, acetylcholine release in bladder outlet obstruction rats was significantly decreased 3 to 6 months after bladder outlet obstruction, and they were significant lower than that of the control group.

Conclusions

T suggests that the long period of partial bladder outlet obstruction caused decrease in electrical field stimulation-induced acetylcholine release and contraction in rat urinary bladder, which may contribute to bladder underactivity in partial bladder outlet obstruction.

References

1. Neurourol. Urodyn., 21:142-153, 2002.
2. J. Urol., 161:1644-1650, 1999.

Effects of duration of partial bladder outlet obstruction(BOO) on electrical field stimulation(40Hz)-induced contractions and acechylcholine(ACh) release in rats

Group		contractions (% 80 mM KCl)	ACh release (pmol/g tissue)
Sham	2 weeks	132.2±9.8	30.10±3.4
	3 months	134.5±8.2	32.41±3.9
	6 months	125.6±9.8	28.33±2.8
BOO	2 weeks	125.5±8.0	27.87±3.4
	3 months	117.3±8.5	18.97±2.8
	6 months	93.8±9.5	9.13±2.0

Significant different from comparable rules of sham rats (p<0.05)