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AGE RELATED CHANGES IN MUSCARINIC CONTRACTION IN HUMAN URINARY BLADDER DETRUSOR MUSCLE STRIPS

Aims of Study

To investigate the afinity diferences for muscarinic receptor-mediated carbachol-induced contraction and relaxation in human detrusor muscle strips in vitro.

Methods

Specimens of human urinary bladder were obtained from 21 patients who underwent total cystectomy for bladder cancer under the ethical rule of our university. The bladders muscle strips 10x2 mm in size were cut from non-cancerous lesion from the bladder anterior wall or dome after removing the mucosa and serosa. Changes in the force of the contractions were measured isometrically in organ baths containing Krebs-Henseleit (K-H) solutions.

Results

Carbachol (CCh; 10-8 10-5M) caused concentration-dependent contractions. After CCh stimulation, muscle strips were washout using K-H solutions for a minute. The muscle strip contraction did not return to base line, but showed some sustaing contraction. Twenty minutes after first washout, the muscle strips were washed-out again for another 1 minute. The muscle strips returned to base line with recovering rhytmic contraction. This sustained contraction was not observed in the rat urinary bladder muscle strips. The persentages of relaxing from CCh contraction by first washout (%1stWR) was changed by patients age (Figure).

Conclusions

First washout may abolish the binding effects of membranous muscarinic receptor with CCh. Age-related decrease of % 1stWD after CCh-induced contraction was observed. Although the radioligand binding study should be employed to confirm, our results suggested the muscarinic receptor in human urinary bladder detrusor muscle is decreased by age. Our results also indicated that age-related less effects with anti-cholinergic drugs for senile patinets with overactive bladder.

References

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