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AGE-RELATED CHANGE IN THE PURINERGIC RESPONSE OF RAT URINARY BLADDER BY ETHANOL

Aim of Study

Ethanol consumption can cause urinary disturbance, especially in aged patients with bladder outlet obstruction. We investigated whether there is the factor of aging on the effect of ethanol on the contractility in the rat urinary bladder.

Materials and methods

Urinary bladder were obtained from male Wistar rats of 8-9 weeks old (young) and 90-98weeks old (aged). The longitudinal muscle strips (2×10mm) were excised from the urinary bladder and mounted in 10ml organ baths containing Krebs-Heinsleit solution at 37 °C with 95% oxygen and 5% carbon dioxide. Changes of tension were measured isometrically with a force displacement transducer. KCl (80mM), carbachol (0.1 to 100uM) and ATP (1 to 100uM) were used as stimulants in this experiment. After measuring the contraction to control stimulation followed by washing with normal Krebs-Heinsleit solution, muscle strips were pretreated with ethanol (0.1 to 3.0%) for 20 minutes and stimulated with same stimulants. The change of tension were compared between control and ethanol-pretreated bladder in the young and aged rats.

Results

The results show: 1) there was no age-related change in the response to KCl and carbachol in normal rat urinary bladder. 2) compared to the control young rat bladder, the response to ATP increased in the control aged rat bladder. 3) after ethanol treatment, the response to KCl, carbachol and ATP decreased in a concentration-dependent manner. 4) the effect of ethanol to decrease the response to carbachol in aged rat bladder was less than that in young rat bladder. 5) the inhibitory effect of ethanol on the ATP-induced contraction was stronger in aged rat bladder than that in the young rat bladder even in a low ethanol concentration.

Conclusions

We found the stronger inhibitory effect of ethanol to purinergic stimulation in aged rat urinary bladder. Urinary retention after drinking will occur frequently in the elderly, because the purinegic receptors play a large role in them.