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Title (type in CAPITAL LETTERS): **PROSTAGLANDIN-LINKED, ATP-INDUCED POST-TONIC CONTRACTION INCREASES WITH AGE IN RAT URINARY BLADDER DETRUSOR MUSCLE**

AIMS OF STUDY

To study the age-related changes (1-3) of bladder function, we investigated the recently discovered "ATP-induced post-tonic contraction" in rats of various ages.

MATERIALS AND METHODS

Urinary bladders were obtained from male Wistar rats at the ages of 9 weeks [young], 24 weeks [adult], and 24 months [aged]. After rats were sacrificed with an intraperitoneal injection of pentobarbital, ATP-induced contraction of resected urinary bladder muscle strips were measured isometrically. A contractile response was induced by adding 10-4M ATP to the organ bath. The strip was then washed with K-H solution and relaxed to baseline, after which a second contraction began. We defined this second contraction as post-tonic contraction. All strips examined phasic (99.1%; n=111) and post-tonic (91.6%; n=105) contraction greater than 0.1g / tension of tissue were utilized in the present investigation. The magnitude of ATP-induced phasic and post-tonic contraction was compared between age groups.

RESULTS

ATP-induced post-tonic contraction did not occur after stimulation with KCl or acetylcholine, but was induced by □, □-methylene ATP. Both phasic and post-tonic contraction were concentration dependent. Although phasic contraction was decreased in aged rats, the magnitude and duration of post-tonic contraction were greatest in aged rats followed by adult and then young rats aged. Nicardipine (a calcium antagonist) showed a slight inhibitory effect on both contractions. Suramin (a non-selective P2 receptor antagonist) inhibited phasic contraction, but did not influence post-tonic contraction. PPADS (a selective P2x receptor antagonist) did not inhibit phasic or post-tonic contraction. In contrast, indomethacin (a prostaglandin synthesis inhibitor) almost completely blocked post-tonic contraction, when added 20 minutes prior to ATP stimulation.

CONCLUSION

These findings suggest that ATP-induced post-tonic contraction is not mediated by the P2x purinoceptor, and that prostaglandin is related to it. Post-tonic contraction was significantly stronger and more persistent in aged rats than in younger rats. This phenomenon may have a close relationship to the adverse changes of the urinary bladder that occur with aging.

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