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EFFECTS OF SILODOSIN AND TAMSULOSIN ON THE SEMINAL VESICLE CONTRACTILE RESPONSE

Hypothesis / aims of study

α1-antagonist is effective for male lower urinary tract symptoms caused by benign prostate hyperplasia, however adverse event is reported regarding ejaculation. Especially, high incidence rate of ejaculatory dysfunction associated with α1a-superselective antagonist 'Silodosin'. It is speculated insufficient contraction of seminal vesicle is one of etiology of ejaculatory dysfunction due to α1-antagonist. In the present study, we investigated the effect of α1-antagonists (Silodosin and Tamsulosin) on the contractile behavior and intraluminal pressure of isolated guinea pig seminal vesicle.

Study design, materials and methods

Guinea pig seminal vesicle, cut at their proximal side, was put into the organ bath and attached to a cannula which was connected to an irrigator and pressure-transducer and the seminal vesicle pressure was continuously measured. The seminal vesicle was stimulated by the electrode with 100 pulses at frequencies of 20 Hz at intervals of more than 5 minutes. The connected seminal vesicle was continuously superfused with the oxygenated Krebs solution and α1-antagonists were dissolved in the Krebs solution flowing into the organ bath. We evaluated the amplitude of the first and max peak as the power and first peak slope as the speed of the contraction.

Results

The electrically evoked contraction was completely abolished by 1μM tetrodotoxin. Silodosin and Tamsulosin (10^{-5}M, 10^{-4}M) weakened the first peak power (Table 1) and max peak power (Table 2) of the seminal vesicle pressure and depressed first peak slope (Table 3) dose dependent manner. In the same drug concentration, Silodosin was more suppressive for the peak amplitude and first peak slope than those of Tamsulosin in statistically. On the other hand, without the electrical stimulation, the seminal vesicle spontaneously contracted frequently in response to the height of the liquid surface of the irrigator. This spontaneous contraction was not blocked by tetrodotoxin and α1-antagonists (Silodsin and Tamsulosin).

Table 1 First peak power (Normalized) n=8

	Krebs	10^{-5} M	10^{-4} M
Silodosin	100	89.1 ± 1.8	39.8 ± 6.0 **
Tamsulosin	100	95.6 ± 8.4	45.8 ± 13.2 *

Table 2 Max peak power (Normalized) n=8

	Krebs	10^{-5} M	10^{-4} M
Silodosin	100	93.8 ± 6.9	70.9 ± 7.7 *
Tamsulosin	100	88.2 ± 9.3	59.1 ± 17.9 n. s.

Table 3 First peak slope (Normalized) n=8

	Krebs	10^{-5} M	10^{-4} M	
Silodosin	100	89.8 ± 5.0	40.2 ± 4.8 **	** $p < 0.01$ vs 10^{-5} M
Tamsulosin	100	105.2 ± 15.9	39.3 ± 13.4 *	* $p < 0.05$ vs 10^{-5} M

Interpretation of results

It is known that the sympathetic nerve heavily innervated in the seminal vesicle muscle wall. The electrical stimulation might excite the innervating sympathetic nerves into the seminal vesicle wall. The electrical stimulation evoked contraction occurred via activation of α1-adrenoceptor, especially α1a-adrenoceptor dominates in the seminal vesicle smooth muscle wall. The seminal vesicle might sense the mechanical stimulation (distention or pressure) and contract spontaneously. This contraction is not involved in the α1-adrenoceptor.

Concluding message

The seminal vesicle has two types contraction. One is via activation of α1-adrenoceptor. α1a-antagonists directly weakened the seminal vesicle contractile response and this might be the main cause of ejaculatory dysfunction. The other is mechanosensitive spontaneous contraction. This contraction is not neurogenic and α1a-antagonists did not affect this contraction.

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What were the subjects in the study?	**ANIMAL**

Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?	**Yes**
Name of ethics committee	**Animal Reserch Committee of the Kurume University School of Medicine**