Effects of naftopidil on inhibitory transmission in substantia gelatinosa neurons of the adult rat spinal dorsal horn.

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Naftopidil is used clinically for the treatment of voiding disorders in benign prostatic hyperplasia. Previous *in vivo* studies in which naftopidil was applied intrathecally abolished rhythmic bladder contraction, suggesting that naftopidil might inhibit a voiding reflex through interaction with spinal dorsal horn neurons. In this study, we aimed to clarify the mechanism of action of naftopidil on spinal dorsal horn neurons by using patch-clamp recording of rat spinal cord slices. In about 30% of neurons, naftopidil increased the frequency of miniature inhibitory postsynaptic currents (mIPSCs) tested. These naftopidil activities were reversible and concentration-dependent manner, and interestingly, bath applied another alpha-1 adrenoceptor antagonist prazosin did not effects of mIPSCs. Although naftopidil was developed as an α -1 adrenoceptor antagonist, our previous studies showed that the activation of an α -1 adrenoceptor in substantia gelatinosa (SG) increases the frequency of mIPSCs. This result suggested that, under our conditions, naftopidil may interact with a site(s) in the spinal dorsal horn. These data suggest that naftopidil enhances the release of GABA and/or glycine by activating inhibitory interneuron terminals in the spinal dorsal horn via an unclear site(s) other than an α -1 adrenoceptor and thereby modulates sensory transmission in SG.