2-P-054

Poster Sessions

Chronic tear deficiency sensitizes TRPV1-mediated response in corneal cold-sensitive nerves

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Corneal cold-sensitive nerves expressing transient receptor potential melastatin 8 (TRPM8) contribute to the detection of ocular surface dryness. Chronic ocular dryness results in neuropathic firing in cold-sensitive nerves, which might be involved in the unpleasant sensation of dry eye. However, the impulse activities mediated by TRPV1, a polymodal nociceptive receptor, have not been well studied in cold-sensitive nerves in normal and tear-deficient guinea pigs. In the present study, we found that TRPV1 was expressed in some TRPM8-positive fibers in the corneal epithelial layer, and that capsaicin, a TRPV1 agonist, increased spontaneous impulse activities in these corneal cold-sensitive nerves in normal guinea pigs. The response latency to capsaicin was significantly shorter in chronically tear-deficient guinea pigs induced by bilateral excision of lacrimal glands, while the ratio of capsaicin-sensitive nerves and total impulse activity induced by capsaicin were not changed. These results suggest that corneal cold-sensitive nerves functionally express TRPV1 and chronic tear deficiency sensitizes TRPV1-mediated nerve activity in cold-sensitive nerves that may relate to hypersensitivity to nociceptive stimuli in dry eyes.