

Abstract

Receptive fields and electrophysiological responses of seventy-three thermoreactive neurones were studied. The receptive fields were 1 to 10 mm wide and 1 to 15 mm long, for the warm thermoreactive neurones and 5 to 15 mm wide and 2 to 31 mm long for cold thermoreactive neurones. The receptive fields of 5 units excited by warming and heating were 5 to 11 mm wide and 3 to 16 mm long. Six units excited by warming and light mechanical stimulation had receptive fields about 1 to 7 mm wide and 1 to 10 mm long. Those of 3 units excited by cooling and light mechanical stimulation were 3 to 10 mm wide and 3 to 15 mm long. Seven bimodal units had receptive fields that were 2 to 30 mm wide and long. The receptive fields were on the ipsilateral scrotal and or inguinal and perineal skin. Only 1 unit had a bilateral receptive field. Seven dorsal horn neurones showed convergence of warm sensitive and nociceptive afferents. Also, 2 units had convergent inputs from cold sensitive and nociceptive afferents. The noxious mechanical excitatory receptive fields were separate and located on the ipsilateral and contralateral toes, the penis or ipsilateral testicle. The thermal excitatory receptive fields of these units were 15 to 17 mm wide and 20 to 21 mm long. The warm and cold-reactive neurones discharged more with the rise and fall in skin temperature, respectively. Five warm-reactive neurones showed bursting activity. The locations of the thermoreactive neurones studied were similar to those reported earlier. It is concluded that dorsal horn thermoreactive neurones, have mainly ipsilateral receptive fields. Secondly, convergence of temperature sensitive and nociceptive afferents occur in the dorsal horn of the rat.