Recording and Stimulation of the Ventralis Intermedius Nucleus of the Human Thalamus

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Abstract

Extracellular recording of the spontaneous and evoked activity in and around the thalamic ventralis intermedius (V.i.m.) nucleus and electrical stimulation of the recorded point were alternated during the course of stereotaxic operation on awake parkinsonian patients to elucidate the possible function of the V.i.m. nucleus. In V.i.m., the neurons were found which responded to contralateral natural stimuli such as passive and active joint movement or muscle compression indicating kinesthetic origin. V.i.m. nucleus and its dorsal area were, in an other part, rich in spontaneous burst discharges, rhythmic and nonrhythmic, most of them being independent from peripheral afferent inflow. When V.i.m. area was stimulated electrically (rectangular pulse of 0.5 msec, 60 Hz, 10 V), weak intensity stimulation produced paresthetic sensation exactly in its peripheral receptive field, and stronger stimulation often resulted in complex movement of the contralateral upper limb around its receptive field, generally being predominant in extensor muscle. The effect of stimulation as well as results of microrecording were compared with those obtained from other surrounding areas and sensorymotor integrative action of V.i.m. was suggested.