Facilitation

Facilitation is a spinal reflex that is considered to be an abnormal response to prolonged stimuli. Partial excitation is the mechanism of facilitation; this happens when an amount of neurons receives prolonged stimulus that lowers the threshold for activation. Since the neurons are already partially excited, much less stimuli is necessary to cause them to propagate impulses. Facilitation occurs in the spinal segment which has three branches: afferent limb, central limb and the efferent limb. A viscerosomatic reflex is a reflex that occurs when sensory input from the viscera produces a reflexive response of the somatic tissues. An example of this is somatic dysfunction in the T1-T5 dermatome caused by myocardial ischemia. A somatovisceral reflex is a reflex that occurs when somatic stimulation causes reflexive dysfunction in viscera that is segmentally related.



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Mechanisms

Partial Excitation

Partial Excitation

Partial excitation is the mechanism of facilitation. In partial excitation, an amount of neurons receives prolonged stimulus that lowers the threshold for activation. Since the neurons are partially excited, much less stimuli is necessary to activate them. This sub-excitatory stimulus can be caused by increased input to the neurons, their environment or changes within the neurons themselves.

Afferent Limb

A-ferret with Sensor

The afferent neuron is responsible for input at a spinal segment, and this is usually a sensory neuron. There are three origins for inputs: they can be from higher parts of the CNS, the visceral neurons or somatic neurons. The afferent limb usually originates in the periphery and ends at the spinal cord to communicate impulses to the central limb. The afferent limb is a neuron that is responsible for causing facilitation by conveying abnormal and prolonged stimuli to the central limb.

Central Limb

Central Spinal Pathway

The central limb of the neuron receives input from the afferent neuron and consists of ascending/ descending, crossing, and branching interneurons. This neuron is where sensory information is processed and complications occur. The central limb is the part of this arc in which facilitation can be sustained from excessive stimulation via the afferent limb. The central limb then becomes sensitive and has a lower threshold for activation. Contrasting with the afferent limb which is responsible for the origin of facilitation; the central limb maintains facilitation. The central limb synapses to convey its impulses to the efferent limb.

Efferent Limb

E-ferret with Motor

The efferent limb receives stimuli from the central limb and is responsible for communicating with the periphery. It conveys impulses to the viscera, via the autonomic nervous system, or to the muscle, via a lower motor neuron

Reflexes

Viscerosomatic Reflex

Visor-sumo-tick with Reflex-hammer

A viscerosomatic reflex occurs when sensory input from the viscera produces a reflexive response of the somatic tissues. A good example of this is myocardial ischemia causing pain in the T1-T5 dermatome.

Somatovisceral Reflex

Sumo-visor with Reflex-hammer

A somatovisceral reflex occurs when somatic stimulation causes reflexive dysfunction in viscera that is segmentally related. For example, a trigger point in the fifth intercostal space is known to cause heart arrhythmias.

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