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Assignment;Discuss the somatosensory pathways

The somatosensory system is a part of the sensory nervous system. The somatosensory system is a complex system of sensory neurons and neural pathways that responds to changes at the surface or inside the body. The somatosensory system is distributed throughout all major parts of our body. It is responsible for sensing touch, temperature, posture, limb position, and more. It includes both sensory receptor neurons in the periphery (eg., skin, muscle, and organs) and deeper neurons within the central nervous system. The somatosensory system is spread through all major parts of the vertebrate body. It consists both of sensory receptors and afferent neurons in the periphery (skin, muscle and organs for example), to deeper neurons within the central nervous system. Somatic senses are sometimes referred to as somesthetic senses, with the understanding that somesthesia includes the sense of touch, proprioception (sense of position and movement), and (depending on usage) haptic perception.

Structure

A somatosensory pathway will typically consist of three neurons: primary, secondary, and tertiary.

- In the periphery, the primary neuron is the sensory receptor that detects sensory stimuli like touch or temperature.
- The secondary neuron acts as a relay and is located in either the spinal cord or the brainstem.
- Tertiary neurons have cell bodies in the thalamus and project to the postcentral gyrus of the parietal lobe, forming a sensory homunculus in the case of touch.

Functions

The somatosensory system functions in the body's periphery, spinal cord, and the brain.

- Periphery: Sensory receptors (i.e., thermoreceptors, mechanoreceptors, etc.) detect the various stimuli.
- Spinal cord: Afferent pathways in the spinal cord serve to pass information from the periphery and the rest of the body to the brain.
- Brain: The postcentral gyrus contains Brodmann areas (BA) 3a, 3b, 1, and 2 that make up the somatosensory cortex. BA3a is involved with the sense of relative position of neighboring body parts and the amount of effort being used during movement. BA3b is responsible for distributing somatosensory information to BA1 and shape and size information to BA2.

Clinical significance

Somatosensory disorder

A somatosensory deficiency may be caused by a peripheral neuropathy involving peripheral nerves of the somatosensory system. This may present as numbness or paresthesia.