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Electrodiagnosis of the peripheral nerve

In the quest of “Chasing the Neuron”, localization of the peripheral nerve lesion is the primary goal of any neurophysiological study. Electrodiagnosis is an extension of the clinical neurological examination, without which one may find oneself lost in maze of peripheral neural axis. An array of different electrodiagnostic modalities are used to trace the neuron from the level of anterior horn cell in the spinal cord, to its end target organ, the post synaptic muscle. Nerve conduction studies are simple tests used to assess and localize the sensory and the motor nerves, with sparing of the sensory fibers in lesions that are pre-ganglionic, due to the residing of the posterior root ganglion away from the spinal foramina. However, in post-ganglionic lesions, both sensory and motor function is impaired, enabling to localize the lesion all along the plexus or the relevant peripheral nerve. Electromyography or needle EMG further helps in pinpointing the lesion, by mapping the presence of active denervating potentials in the muscles supplied by the affected nerve, assess for re-innervation as well as prognosticate recovery. By fatiguing the neuromuscular junction, in repetitive nerve stimulation, one can assess abnormalities of neuromuscular transmission and acquire information regarding a pre-synaptic or post-synaptic defect. Further specialized single-fiber electromyography studies enable to perform meticulous assessment of the jitter from single muscle fiber action potentials. Needle EMG is also the essence of differentiating a primary muscle origin disorder from an underlying neurogenic process. We summarize the use of electrodiagnostic modalities in the assessment of peripheral nerve disorders.

Biography

Sajjad Ali completed his training in Clinical Neurophysiology from the West Midlands Denary, UK and then worked as a Physician Consultant at the Queen Elizabeth Hospital Birmingham (QEHB), where he gained experience in the clinical and electrodiagnostic evaluation of peripheral nerve disorders and developed his special interest in single-fiber electromyography, under the mentorship of Professor Erik Stalberg (Uppsala, Sweden). Currently, he works in one of the largest healthcare organizations in KSA, the National Neurosciences Institute, King Fahad Medical City, Riyadh. Other research and special interests of his include EMG-guided Botox injections for spasticity, neuro-intraoperative monitoring and sleep studies.

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