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Electrophysiological correlates of intermediate syndrome following acute organophosphate poisoning

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Organophosphate (OP) poisoning is a major global health problem. The late onset of respiratory failure associated with intermediate syndrome (IMS) is a major contributor to the high morbidity, mortality, and cost of OP poisoning. An understanding of the abnormalities observed in repetitive nerve stimulation studies during the progression and development of IMS spectrum disorder following OP poisoning may help clinicians to utilize electrophysiological studies in the better management of their patients. Clinical and experimental electrophysiological studies of IMS shows that subclinical electrophysiological abnormalities are common, progressive, and precede the onset of the clinical IMS. Clinical and experimental studies demonstrate a progression through early initial decrement–increment patterns at high rates of stimulations, which correlate with moderate muscle weakness, to decrement–increment patterns at intermediate- and low-frequency stimulations. Progression to a combination of decrement–increment and repetitive fade patterns correlates with clinical deterioration; severe decrement pattern is usually observed immediately before the onset of respiratory failure. Although electrophysiological features closely parallel clinical severity during progression of IMS, the same is not true during recovery. Electrophysiological changes sometimes improve long before the patient recovers normal strength and respiratory function. While IMS remains a clinically important entity, the early occurrence of abnormalities on repetitive nerve stimulation studies suggest that this is part of the continuum of nicotinic receptor stimulation.