Differences in membrane properties of axonal and demyelinating Guillain-Barre syndromes

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摘要

Abstract

Guillain-Barré syndrome is classified into acute motor axonal neuropathy (AMAN) and acute inflammatory demyelinating polyneuropathy (AIDP) by electrodiagnostic and pathological criteria. In AMAN, the immune attack appears directed against the axolemma and nodes of Ranvier. Threshold tracking was used to measure indices of axonal excitability (refractoriness, supernormality, and threshold electrotonus) for median nerve axons at the wrist of patients with AMAN (n = 10) and AIDP (n = 8). Refractoriness (the increase in threshold current during the relative refractory period) was greatly increased in AMAN patients, but the abruptness of the threshold increases at short interstimulus intervals indicated conduction failure distal to the stimulation (ie, an increased refractory period of transmission). During the 4 week period from onset, the high refractoriness returned toward normal, and the amplitude of the compound muscle action potential increased, consistent with improvement in the safety margin for impulse transmission in the distal nerve. In contrast, refractoriness was normal in AIDP, even though there was marked prolongation of distal latencies. Supernormality and threshold electrotonus were normal in both groups of patients, suggesting that, at the wrist, membrane potential was normal and pathology was relatively minor. These results support the view that the predominantly distal targets of immune attack are different for AMAN and AIDP. Possible mechanisms for the reduced safety factor in AMAN are discussed.