

NURS 821 Neurological Disorders

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Lecture 11

Part 7 Peripheral Nervous System Disorders

The Peripheral Nervous System (PNS)

- Definition: the portion of the nervous system consisting of the nerves and ganglia outside of the brain and spinal cord.
- Pathology: The nerve fibers traveling to and from the brainstem and spinal cord may be injured by disease processes.
 - Injury may affect a distinct anatomic area on the nerve fibers, at the roots, the plexus before the peripheral nerve formation, or the nerves themselves.

Neuropathies

Pathology:

- Result from an apparent autoimmune cellular reaction that specifically attacks the myelin sheath of peripheral nerves (In contrast, demyelination in MS is confined to the CNS!)
- Associated with diverse diseases, conditions such as...

Neuropathies

- Motor neuropathies caused by:
 - Guillain – Barré syndrome, infectious mononucleosis, viral hepatitis
 - Acute porphyria, lead, mercury, and triorthocresylphosphates (TCP)
- Pure sensory neuropathies caused by:
 - leprosy, industrial solvents, chloramphenicol, and hereditary mechanisms

Neuropathies

Clinical features:

- Affect muscle strength, tone, and bulk
- Whole muscles or groups may be weak or paralyzed – muscles of feet and legs first then hands and arms
- Tone and deep tendon reflexes generally decreased with atrophy and fasciculation

Neuropathies-Clinical Manifestations

- | | |
|---|-------------------------|
| ■ Mild fatigue | ■ Autonomic disturbance |
| ■ Some specific symptoms of paresthesia and dysesthesia | ■ Deformities |
| ■ Altered reflexes | ■ Metabolic changes |

Guillian – Barré Syndrome

- Definition: an acute demyelinating polyneuropathy
- Primarily ascending motor paralysis with variable disturbances of sensory function
- Found throughout the world
- Both genders, all ages, all seasons
- Approx. 3500 cases per year in North America

Source: Victor & Ropper (2001)

Guillian – Barré Syndrome

- Cause: Unknown
- Precipitating events may be:
 - Viral illness occurring 1 – 3 weeks before onset of motor weakness
 - Mild URI/GI infection
 - Surgery
 - Immunization (1976 – 500 cases attributed to swine flu vaccine influenza)
 - Lupus erythematosus

Guillian – Barré Syndrome Manifestations

- Acute onset of motor paralysis
- Paresis of legs to complete quadriplegia
- Respiratory insufficiency
- Autonomic nervous system instability
- May progress to respiratory arrest or cardiovascular collapse

Guillain – Barré Syndrome

- Greater than 80% of patients make a full or nearly complete recovery, which can take from a few weeks to several months, depending on the extent of myelin and axonal degeneration

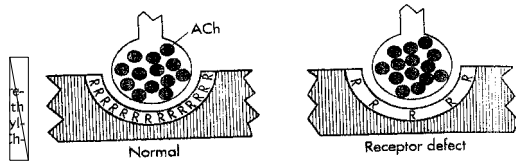
Myasthenia Gravis (MG)

- Definition: An autoimmune disorder that affects the neuromuscular junction
- The most striking feature is the weakness experienced with repetitive movement and the quick restoration of power with rest
- Incidence:
 - 4 in 10,000 population
 - Peak age of onset is 20
 - F>M 3:1
 - Second peak occurs in older men in their 50's and 60's

MG Pathophysiology

- Etiology: Unknown
 - IgG antibody is secreted against acetylcholine receptors and fixes onto the receptor sites blocking acetylcholine binding
 - Eventually, IgG action destroys receptor sites, leading to lack of muscle depolarization
 - The acetylcholine receptors on the muscle cell's plasma membrane are no longer recognized as "self" eliciting an antigenic effect
 - Results in defect in nerve impulse transmission at the neuromuscular junction

Myasthenia Gravis (MG)



MG Clinical Manifestations

- Insidious onset
- Recent history of URI
- May first appear during pregnancy, post partum period, or with certain anesthetic agents
- Fluctuating weakness of voluntary muscles, particularly facial and extra ocular muscles
- Muscle weakness that increases with activity
- Muscle strength that improves with rest
- Muscle strength that improve in response to anticholinesterase medications
