

MOVEMENT DISORDERS UPDATE

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Movement Disorders

- Hypokinesia : decreased voluntary and automatic movements
- Hyperkinesia : excessive movements

HYPOKINESIAS

- Parkinson's disease
- Secondary Parkinsonism
- Parkinson's plus syndromes

PARKINSON'S DISEASE

Classical Clinical Features

- Resting Tremor
- Cogwheel Rigidity
- Bradykinesia
- Postural Instability

Parkinsonism

- Consists of at least 2 of the 4 cardinal signs : (mnemonic=TRAP)
- T – Tremor
- R – Rigidity
- A – Akinesia
- P – Postural Impairment

PARKINSON'S DISEASE

Features supporting diagnosis

- Unilateral symptom onset
- Characteristic resting tremor
- Narrow-based gait with flexed/stooped posture
- Reduced arm swing with tremor when walking
- Sustained and significant levodopa effect

PARKINSONISM

AAN Practice Parameter Recommendations:
Clinical features distinguishing other parkinsonian syndromes from PD

- Falls at presentation and early in the disease course
- Poor response to levodopa
- Symmetry at onset
- Rapid progression of postural imbalance and dysfunction
- Lack of tremor
- Early dysautonomia

PARKINSONISM

- Parkinson's disease
- Secondary parkinsonism
 - Drug-induced parkinsonism
 - Vascular parkinsonism
- Parkinson's plus syndromes
 - Multiple system atrophy
 - Progressive supranuclear palsy
 - Corticobasal Degeneration

PARKINSONISM

Secondary parkinsonism

- Post-encephalitic parkinsonism (influenza epidemic 1917)
- Dementia with Lewy bodies
- Idiopathic familial basal ganglionic calcification (Fahr Syndrome)
- Late stages of Alzheimer's disease
- Some patients with Frontal Temporal Lobar Dementia

PARKINSONISM

Drug and toxin-induced parkinsonism

- Drugs: Classic antipsychotic agents and some antiemetic drugs.
- Toxins: Carbon bisulfide, carbon monoxide cyanide, manganese, and some organic solvents.

PARKINSONISM

Vascular parkinsonism

- Small vessel vascular disease
- Mostly parkinson gait-like disorder

PARKINSON PLUS SYNDROMES

Multiple System Atrophy

- Olivopontocerebellar atrophy, striatonigral degeneration and Shy-Drager
- Parkinsonism with associated dysautonomia, cerebellar ataxia, and/or pyramidal signs
- Poor response to levodopa
- Usually well preserved cognitive function

PARKINSON PLUS SYNDROMES

Corticobasal Degeneration

- Progressive asymmetric onset in one limb associated with akinesia, rigidity, dystonia, focal myoclonus, apraxia, and alien limb phenomenon
- Cognitive impairment common, may be presenting feature

PARKINSON PLUS SYNDROMES

Progressive supranuclear palsy

- Early gait difficulty with frequent falls
- Progressive loss of ocular motility
- Later dysarthria, dysphagia, rigidity & dementia
- Manikin-frown, procerus sign
- May initially look very much like Parkinson's disease

Treatment of Parkinson's Disease and Parkinsonian Syndromes

DOPAMINERGIC AGENTS

- Dopamine Precursors: Levodopa
- Decarboxylase Inhibitors: Carbidopa
- Dopamine Agonists: Pramipexole (Mirapax)
ropinorole(Requip) apomorphine,
rotigotine (Neupro)
- Catechol-o-methyltransferase inhibitors:
entacapone(Comptan), tolcapone(Fosmar)
- MAO-B inhibitors: selegiline (Deprenyl)
rosagiline(Azilect)
- Dopamine releaser: amantadine (Symmetrel)

NON-DOPAMINERGIC AGENTS FOR MOTOR SYMPTOMS

Antimuscarinics: Trihexyphenidyl (Artane)
benztropine (Cogentin)

TREMOR

Involuntary, somewhat rhythmic, muscle contraction and relaxation involving to-and-fro movements (oscillations or twitching) of one or more parts of the body

It is the most common of all movement disorders and can affect all parts of the body

TREMOR

- Most common movement disorder in the elderly
- Affects men and women equally
- Rhythmic shaking of hands, arms, head, legs, voice
- Dysfunction of muscle control and coordination of agonist & antagonist muscles
- Triggered by or become exaggerated during stress or strong emotion, physical exhaustion, or with certain postures or movements
- Many causes : idiopathic, brain injury, drug-induced, alcohol, toxin (mercury), metabolic (thyroid & liver diseases)

CLASSIFICATION OF TREMORS

- Resting tremor
 - Parkinsonian tremor
- Action tremor
 - Postural tremor
 - Kinetic tremor
- Psychogenic tremor

RESTING TREMOR

- Idiopathic Parkinson's disease
- Pronation/supination
- Slower rate (5-6Hz)
- Present when walking
- Reemergence tremor

ACTION TREMOR

- Essential tremor
- Physiologic tremor
- Dystonic tremor
- Cerebellar tremor
- Orthostatic tremor
- Task-specific tremor
- Psychogenic tremor

ESSENTIAL TREMOR

- Present in about 4% of population over 65
- Frequently hereditary, but exact etiology and pathology are unknown
- Affects both sides of body, but usually asymmetric : hands, arms, head, voice (tongue, legs, trunk)
- Typically high frequency tremor involving flexion/extension muscles
- Severity increases with age
- Reduction with alcohol and a positive family history are supportive information
- Treatment with beta-blocker, primidone, botulinum, toxin injection or deep brain stimulation

PHYSIOLOGIC TREMOR

- Very fine, high frequency, low amplitude tremor
- Occurs in normal individual & typically without clinical significance
- Enhanced physiologic tremor may heighten Parkinson's tremor to more visible levels
- Caused by strong emotion, physical exhaustion, hypoglycemia, hyperthyroidism, heavy metal poisoning, stimulants, alcohol withdrawal, or fever
- Usually reversible once the cause is corrected

DYSTONIC TREMOR

- Occurs in individuals with dystonia : sustained involuntary muscle contractions causing twisting and repetitive motions and/or painful and abnormal postures or positions
- Dystonic head tremor
- Occurs when the individual is in a certain position or moves a certain way
- Occurs irregularly and often relieved by complete rest
- Touching the affected body part or muscle may reduce tremor severity (geste antagoniste)
- Responds well to botulinum toxin treatment

CEREBELLAR TREMOR

- Slow, high amplitude, irregular tremor that occurs at the end of a purposeful movement
- Caused by lesion in or damage to the cerebellum and its outgoing nerves by stroke, tumor, multiple sclerosis, degenerative diseases, alcoholism, and certain medications
- Often most prominent when the individual is active or is maintaining a particular posture
- May be accompanied by dysarthria, nystagmus, and gait ataxia

ORTHOSTATIC TREMOR

- Rhythmic contractions that occur in the legs and trunk immediately after standing
- Cramps in thighs and legs
- Shakes uncontrollably when the individual is asked to stand in one spot
- No clinical signs or symptoms when the individual sits or is lifted off the ground

TASK-SPECIFIC TREMOR

- Also known as focal tremor or occupational tremor
- Occurs mostly in hands when in a certain position or performing a certain task: writing, throwing a ball, bowing the violin, swinging a golf club (“Yips” in golf), gripping a glass
- May benefit from beta-blocker, anticholinergic, or botulinum toxin injection

PSYCHOGENIC TREMOR

- Occurs at rest or during postural or kinetic movements
- Sudden onset and remission, increased incidence with stress
- Bizarre movements that are distractible, variable and inconsistent
- Associated with conversion disorder and psychiatric disease

SYMPTOMATIC TREATMENT OF ACTION TREMOR

- Pharmacological therapy
 - Beta-blocker (propranolol, Inderal), (primidone Mysoline)
 - alpha-2-delta ligand (gabipentin, Neurontin), pregabalin, Lyrica
- Physical rehabilitation
 - Weighted bracelets, occupational therapy
- Botulinum toxin treatment
 - Intramuscular injection to weaken dominant muscles
- Neurosurgical procedure
 - Deep brain stimulation

RESTLESS LEGS SYNDROME

- Very common movement disorder
- Occurrence and intensity increase with age
- 10-12% of adults and >19% in those 80 years or older
- Disagreeable and troublesome sensation in legs
- Diagnostic criteria:
 - Urge to move legs
 - Worsening of symptoms with rest
 - Relief with activity
 - Intensification during the evening

RESTLESS LEGS SYNDROME

- Causes anxiety, sleep deprivation, malaise, fatigue
- Associated with iron deficiency, peripheral neuropathy, kidney or liver disease, and offending medications
- Recognizing symptoms and seeking medical attention are important
- Accompanied by periodic limb movements of sleep

RESTLESS LEGS SYNDROME

- Treatments include:
 - Removing offending medications:
SSRI, neuroleptics, Lithium, antihistamines,
MAOI
 - Iron supplement
 - Avoid idleness
 - Good sleep hygiene
 - Dopamine agonist
 - Opiates
 - Alpha-2-delta ligands

- How To Prevent Augmentation:
 - Use lowest recommended dose of dopaminergic medications
 - Maximum doses:
 - a.) pramapaxole (Mirapex), 0.5 mg/24 hrs
 - b.) ropinirole (Requip), 3 mg/24 hrs
 - c.) rotogotine (Neupro), 3 mg/24 hrs

DRUG INDUCED MOVEMENT DISORDERS

DRUG INDUCED PARKINSONISM

- Antipsychotics
- Antiemetics-Metaclopramide (Reglan), Domperidone (Motilium)
- Dopamine Inhibitors-Deutetrabenazine(Austedo), Reserpine (Serpasil)
- Methyldopa (Aldomet)
- Valproate (Depakote)

DRUG INDUCED TREMOR

- Antipsychotics
- Anticonvulsants
- Lithium
- Tricyclic and SSRI antidepressants
- Beta-Adrenergic agonists
- Theophylline
- Amphetamines
- Thyroid Medications
- Caffeine
- Amiodarone
- Corticosteroids
- Cyclosporine

DRUG INDUCED CHOREA

- Antipsychotics
- Antiemetics
- Dopamine agonist
- Levadopa
- Antidepressants
- Anticonvulsants

DRUG INDUCED DYSTONIA

- Antipsychotics
- Antiemetics
- Antiparkinson medications

DRUG INDUCED TARDIVE DYSKINESIA

- Classic oral-buccal-lingual-dyskinesia
- Tardive dystonia
- Tardive akathisia
- Tardive akathitic movements
- Tardive myoclonus

Treatment Of Tardive Syndromes

- Mainstay of medical treatment is the use of dopamine depleting drugs such as:
Reserpine (Serpasil),
Deutetrabenazine(Austedo).
- Reserpine treatment may require high doses (5 to 8mg) to reach maximum effects
- Deutetrabenazine has quicker onset and fewer side effects

MOVEMENT DISORDERS

Summary

- Movement disorders are common.
- Many of them share features of slowness, stiffness, tremor, unsteadiness
- Distinguishing them from normal aging process can be challenging
- Recognizing them and seeking appropriate treatment are important
- Some of them are highly treatable

REFERENCES

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Neurology.org

<http://www.neurology.org/>