Vanderah: Nolte's The Human Brain, 7th Edition

Test Bank

Basal Ganglia

Multiple Choice

1. Damage to the subthalamic nucleus would result in which of the following motor disturbances?

A. Choreiform
B. Hemiballismus
C. Bradykinesia
D. Hemiplegia
E. Athetoid

ANS: B
The subthalamic nucleus participates in the basal nuclei indirect pathway to decrease activity of the thalamus, thereby decreasing cortical stimulation. If unopposed by subthalamic input from the indirect pathway, the thalamus is disinhibited by input from the direct pathway, thereby increasing cortical stimulation. Clinical signs include uncontrolled flinging movements of the contralateral upper and/or lower limb.

2. A 48-year-old woman has a history of schizophreniform disorder that is controlled by daily administration of clozapine. After being transferred to a new facility, the woman is switched from clozapine to risperidone and subsequently develops frequent and forceful blinking of her eyelids. When the condition is exacerbated by light, the woman blinks her eyes nearly 40 times in one minute. An ophthalmological consultation was unremarkable for any eye pathology contributing to this presentation and the neurological examination did not reveal any other abnormal movements.

Which of the following most specifically describes the motor symptoms experienced by this woman?

A. Intention tremor
B. Hypokinetic
C. Dystonia
D. Asterixis tremor
E. Hypertonia

ANS: C
Involuntary muscle contractions that are spasmodic and repetitive are referred to as dystonic movements. Treatment with neuroleptic medications, mostly atypical neuroleptics, can cause an imbalance in the basal nuclear motor loop and result in blepharospasms (twitches or excessive blinking of the eye) or tardive dyskinesia. Symptoms usually disappear after discontinuing the medication.

3. A 12-year-old girl experiences acute onset of rapid, flowing, movements of her extremities and facial grimacing. Her parents report to the emergency physician that the girl had been diagnosed with rheumatic fever 3 months earlier and treated with antibiotics.

This girl is most likely suffering from which of the following?

A. Parkinson's disease
B. Cerebellar degeneration
C. Sydenham's chorea
D. Wilson's disease

ANS: C
Sydenham's chorea is an autoimmune disease most often affecting children under the age of 18. It typically occurs secondary to infection with group A β-hemolytic streptococci, which results in rheumatic fever. The disease adversely affects basal ganglia function but generally subsides after several weeks.

4. Cortical projections that excite striatal cells participating in the direct pathway lead to inhibition of the

A. Globus pallidus internus and substantia nigra, pars reticulata
B. Globus pallidus internus and substantia nigra, pars compacta
C. Globus pallidus externus and substantia nigra, pars compacta
D. Globus pallidus externus and substantia nigra, pars reticulata

ANS: A
Striatal projections of the direct pathway inhibit the internal segment of the globus pallidus and substantia nigra pars reticulata, resulting in the net effect of increased thalamic activity.

5. Progressive loss of medium spiny neurons throughout the striatum is a pathophysiological characteristic of which of the following?

A. Hypertonia
B. Dystonia
C. Hemiballismus
D. Wilson's disease
E. Huntington's disease

ANS: E
Huntington's disease is an autosomal dominant movement disorder that results in the selective degeneration of medium spiny neurons of the striatum. Clinical signs include hypotonia, choreiform movements, and dementia.

6. A magnetic resonance image of a patient with Wilson's disease would most likely reveal which of the following?

A. Brain sand
B. Cavitation in the lenticular nucleus
C. Aqueductal stenosis
D. Arteriovenous malformations
E. Hemorrhagic lesion

ANS: B
Wilson's disease is an autosomal recessive disorder caused by a defect in the ability to metabolize copper. Lesions are commonly present in the lentiform nucleus. Patients may also have a yellow-green ring around the iris as a result of deposits of copper.

7. Which of the following most characteristically describes the tremor seen in patients with Wilson's disease?

A. Choreiform
B. Ballismus
C. Asterixis
D. Resting
E. Intention

ANS: C
Patients with Wilson's disease are likely to display a wing-beating tremor (asterixis). The upper extremities are rapidly moved up and down at the wrist or shoulder joint.

8. An autopsy is performed at the request of the family after the death of an 89-year-old man. During sectioning of the brain, the substantia nigra is noted to have significant degeneration in the area of the pars compacta. This man most likely suffered from which of the following?

A. Foville's syndrome
B. Tourette's syndrome
C. Wilson's disease
D. Parkinson's disease
E. Huntington's disease

ANS: D
Degeneration of the dopaminergic neurons within the pars compacta of the substantia nigra is the pathogenic mechanism of Parkinson's disease.