

The Disease of Aging

COMMON NEUROLOGICAL DISORDERS

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AGING!

When does aging start?

Aging

- One of the most fundamental, yet mysterious aspects of biology
- The science of aging has made progress in describing and analyzing several critical phenotypes of the components of aging including:
 - Inflammation
 - Oxidative stress
 - Endocrine abnormalities
 - Cellular changes
 - Genomic damage and instability
 - Mitochondrial dysfunction
 - Increased junk proteins

Aging

- Aging research has extensively showed conserved protective effects associated with dietary restrictions (DR) or caloric restrictions (CR)
- Dietary and caloric restrictions are the gold standards in terms of a basic environmental manipulation that slows aging in virtually every species

Aging

- CR and DR function as a global metabolic reprogramming for most organisms, reflecting a shift of biological priorities from growth and reproduction towards stasis and conservation

Aging

- Western lifestyle and an associated pandemic of obesity, reflecting radical departure from our evolutionary environment will expose us to increased penetration by the disease of aging despite increasing life expectancy

Aging

- Multifactorial life style changes may increase many of the phenotypes or components of aging
 - Poor sleep
 - Little exercise
 - Complex dietary shifts
 - Increased social isolation

Aging

- The Aging Process of the Brain
 - Cannot be separated from aging of the whole organism
 - Must consider that aging may be differentially expressed across different organ systems

Aging

- Changes in Neurological Examination with age
 - Diminished smell
 - Abnormal upward gaze
 - Hearing loss
 - Diminished coordination
 - Diminished fluidity of movement
 - Neurocognitive function decline

Genetic Neurology

- Neurological Exam
 - History
 - Reviewing medications
 - Mental status exam
 - Physical examination

Neurological Conditions

- Stroke
- Parkinson's disease
- Tremor
- Dizziness and vertigo
- Gait disturbance
- Memory and cognitive decline (Dementia)

Stroke

- Human aging characterized by progressive constriction of the homeostatic reserve of every organ system
 - Evident by 3rd decade—gradual and progressive
 - Influenced by diet, environment, personal habits, and genetic factors

Stroke

- Changes with Age
 - Increased relative total body fat
 - Decreased circulatory volume
 - Hormonal changes
 - Medications
 - Blood pressure
 - Cholesterol
 - Smoking, alcohol consumption
 - Activity level

Stroke

- Modifiable Risks
 - Personal habits
 - Medical illness
 - Diet
- Non-modifiable Risk Factors
 - Age
 - Genetics

Stroke

- Treatment
 - Decreasing the risk for future strokes
 - Managing the stroke
 - Medications

Parkinson's Disease

- The Hallmark: Dopamine deficiency in the basal ganglia
- Motor Symptoms
- Non-motor Symptoms
- Treatment
 - Medications
 - Surgery
 - Exercise

Tremor

- Essential Tremor
- Other Tremor disorders
 - Cerebellar
 - Thalamic
 - Cortical Loop
- Differentiates from:
 - Parkinson's Disease
 - Familial Essential Tremor

Tremor

- Bilateral Hands
- Lower Jaw
- Resting/Postural/Action
- Treatment

Dizziness and Vertigo

- Benign Paroxysmal Positional Vertigo (BPPV) most common
 - Treatment include vestibular exercises and medication (Meclizine)
- Other peripheral causes
 - Neuritis
 - Meniere's Disease
 - Medication side effects
- Central Causes
 - Vascular
 - Mass
 - Inflammation
 - Infection

Gait Disorders

- Can increase the risk of falls, disability, and mortality
- Neurological Causes
 - Vascular
 - Neuropathy
 - Myelopathy
 - Parkinson's Disease
 - Normal Pressure Hydrocephalus (NPH)
 - Diseases of the Cerebellum
- Non Neurological Causes
 - Apraxia
 - Cognitive impairment

Memory and Cognitive Decline (Dementia)

- Neurocognitive function declines with aging, which include:
 - Episodic Memory: Word list recall
 - Working Memory: Digit span forward/backward
 - Spatial Memory: Dimension, Drawing
 - Processing Speed
 - Learning Skills: Learning new information
 - Various Motor Functions: Motor speed and fine motor control

Memory and Cognitive Decline (Dementia)

- Assessment of Cognitive Status in Geriatric Neurology
 - Mental Status Examination
 - Level of consciousness
 - General appearance
 - Mood and Affect
 - Behavior
 - Movement
 - Speech and Communication
 - Thought Form and Content
 - Perception
 - Insight
 - Cognitive assessment

Memory and Cognitive Decline (Dementia)

- Cognitive Assessment
 - Attention/Concentration
 - Orientation
 - Memory
 - Language
 - Abstract Thinking
 - Judgment
 - Construction Skills
 - Calculations

Memory and Cognitive Decline

Mild Cognitive Impairment (MCI)

- MCI is a transitional state between cognitively normal state and dementia syndrome
- The rate of progression from MCI to Alzheimer's Disease is 12-15%
- The primary benefit to diagnosing MCI is to recognize the risk and progression to full dementia and to find early therapeutic interventions

Memory and Cognitive Decline

Mild Cognitive Impairment (MCI)

- Defining MCI

- Episodic Memory
- Anomia
- Visual Agnosia
- Abulia
- Disinhibition
- It is challenging to determine whether a clear history of cognitive deterioration is present
- Lowering the criteria or threshold may increase false positive results

Memory and Cognitive Decline

Mild Cognitive Impairment (MCI)

- Criteria for MCI require the following features:
 - Memory complaints
 - Evidence of objective memory impairment
 - Preserved global cognition
 - Intact Activity of Daily Living (ADL)
 - Absence of dementia
 - Follow and reassessment

Memory and Cognitive Decline

Mild Cognitive Impairment (MCI)

- Intervention and treatment
 - Pharmacologic
 - Non-pharmacologic
 - Regular cognitive activity
 - Physical exercise
 - Cognitive rehabilitation

Memory and Cognitive Decline

Alzheimer's Disease

- By far the most common form of dementia in the US
- Affects 5.4m people, mainly above 65yr
- 1-2% at age 65yr
- Doubles every 5yr
- As high as 50% by age of 85
- Estimated number of patients will be 16-80 million by 2050
- 50% of cases are mixed type

Memory and Cognitive Decline

Alzheimer's Disease

- Symptoms
 - History
 - Memory
 - Cognitive
- Differential Diagnosis
 - Vascular
 - Lewy Body Disease
 - Parkinson's Disease
 - Fronto-temporal Dementia
 - Pseudo-dementia

Memory and Cognitive Decline

Vascular Dementia (VD)

- The 2nd leading cause of dementia, either alone or in combination
- Potentially preventable, but recent increase in vascular risk factors warn that the frequency of VD may rise
- Usually abrupt onset or shortly after a stroke
- Symptoms
 - Apathy
 - Naming
 - Comprehension
 - Insight
 - Other neurological symptoms

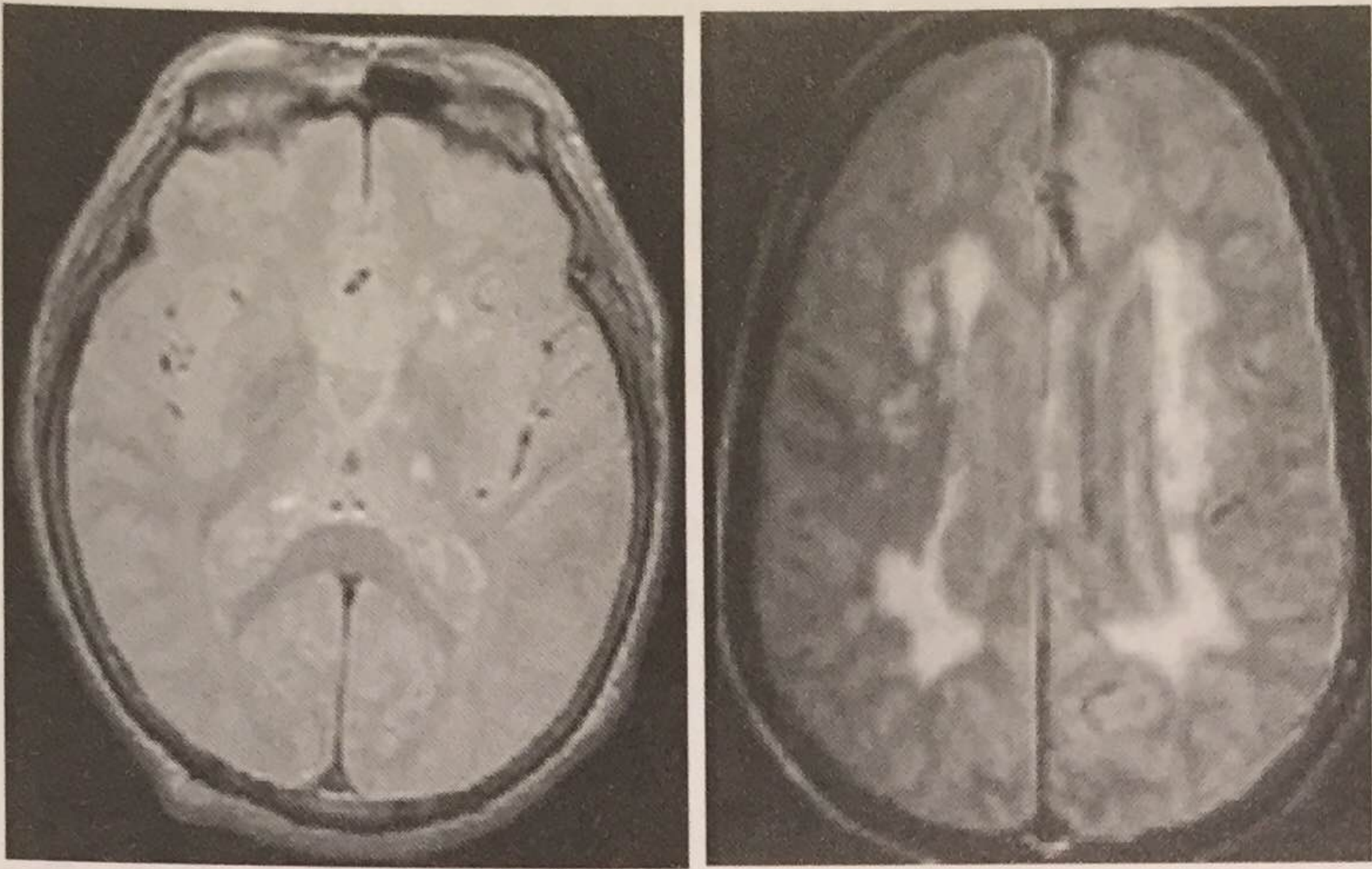


Figure 9.3, Pg. 225:Nair, Anil K., and Marwan N. Sabbagh. *Geriatric Neurology*. Chichester, UK: John Wiley & Sons, 2014. Print.

Memory and Cognitive Decline

Dementia of Lewy Bodies

- Progressive dementia syndrome with parkinsonism, dominated by attentional visuospatial and executive dysfunction, visual hallucinations, sleep disturbance

Memory and Cognitive Decline

Dementia of Lewy Bodies

○ Clinical Symptoms

- Similar to dementia of Alzheimer's disease with progressive loss of cognitive function
- Relative preservation of short and medium term recall and recognition
- Greater impairment of visual perception and performance tasks
- Fluctuating attention
- Delusions
- Sleep disorder
- Gait instability

Memory and Cognitive Decline

Treatment of Dementias

- Pharmacological treatments
 - Primary—Preventative therapy
 - Secondary—Disease modifying and curative (rare)
 - Tertiary—Palliative and to improve quality of life

Memory and Cognitive Decline

Treatment of Dementias

- Primary pharmacological treatments
 - No available preventative medications
 - Recent advances in research and identifying markers
 - Knowledge of neural injury to find neuroprotective medication

Memory and Cognitive Decline

Treatment of Dementias

- Secondary pharmacological treatments
 - Current symptomatic treatment includes:
 - Namenda
 - Aricept
 - Exelon
 - Razadyne
 - These medications demonstrate only modest symptomatic benefit that is sustained for 6 months to a few years

Memory and Cognitive Decline

Treatment of Dementias

- Tertiary pharmacological treatments
 - To help control patient's behavioral problems

Memory and Cognitive Decline

Treatment of Dementias

- Non-pharmacological treatment
 - Nonspecific intervention
 - Empathy
 - Attention
 - Social issues
 - Specific intervention
 - Environmental
 - Personal
 - Behavioral
 - Medications
 - Caregiver education and resources

References

- Nair, Anil K., and Marwan N. Sabbagh. *Geriatric Neurology*. Chichester, UK: John Wiley & Sons, 2014. Print.
- Sadock, Benjamin James, and Virginia Alcott Sadock. *Kaplan and Sadock's Synopsis of Psychiatry*. 9th ed. Vol. 1. Philadelphia, PA: Lippincott Williams & Wilkins, 2002. Print.
- Daroff RB, Fenichel GM, Jankovic J, Mazziotta JC, eds. *Bradley's Neurology in Clinical Practice*. 6th Edition, Vol. I: *Principles of Diagnosis and Management*, Vol. II: *Neurological Disorders*. Elsevier Saunders 2012. Print.