YOUR HEALTHY BRAIN

KRISTI P GILL, D.O.
NEUROLOGIST
OBJECTIVES

• Discuss what can be done, by anyone, to help protect brain health

• Review examples from established and current research on risk factors for the most common neurologic diseases associated with aging.
OBJECTIVES

• Discuss the main categories of neurological diseases that we are all at risk for with aging- the biggest risks to our brain health
  • Stroke
  • Mild cognitive impairment and dementia

• Discuss the difference between modifiable and non-modifiable risk factors
OBJECTIVES

• Discuss, with examples from recent research, what we know about how stroke and dementia risk is affected by:
  • Diet (including dietary supplements)
  • Exercise
  • Mental Health
  • Social interaction
  • Sleep
  • Other diseases
YOUR HEALTHY BRAIN
AGING AND HEALTH

Aging well depends on your:

- Genes
- Environment
- Lifestyle

Healthy lifestyle choices may help you maintain a healthy body and brain

From US Dept Health and Human Services Administration for Community Living
NEUROLOGIC DISEASES OF AGING

RISKS TO BRAIN HEALTH
WHAT IS DEMENTIA?

• Progressive decline in one or more cognitive domains, more than expected for normal aging

• Must result in impairment of independence in functional activities

• Must be chronic (if it’s an acute change, we call it delirium – which can be, and commonly is, superimposed upon dementia)
DEMENTIA

• Onset before age 60 is rare
• After age 60, incidence doubles about every 5 years
• If one survives to age 100, incidence is probably greater than 75%
• Twin studies suggest probably 70% of risk is related to genes. What about the other 30%?

• Breitner JCS and Galasko D; Encouraging trends toward reduced risk of Alzheimer disease: What's good for the heart is good for the brain. Neurol Clin Practice 2015;5:190-192
DEMENTIA SYMPTOMS

• Memory loss
• Impaired executive function
• Visuospatial problems
SUBTYPES OF DEMENTIA

• Alzheimer’s
• Vascular Dementia
• Dementia with Lewy Bodies and other Parkinsonian Dementias
• FTD (“Pick’s Disease”)
• Other causes:
  • Nutritional problems
    • B12, Thyroid, Liver, Kidney
  • Alcoholic dementia
  • Post-traumatic
  • NPH
  • Medication-induced
    • Pain medications, anxiety medications, sleeping pills, bladder medication
  • Mood disorders
“SENIOR MOMENTS”

• Difficulty finding words or recalling names
  • Retrieval problem, rather than memory
  • “tip of the tongue” phenomenon
• Slowing of processing
• Increased difficulty with multitasking/more easily distracted
MILD COGNITIVE IMPAIRMENT

• “Somewhere in between”

• Three main points
  • 1) Complaints of cognitive problems
  • 2) Problems are greater than one would expect for age
  • 3) Preserved independence in functional activities – may have some mild problems with more complex activities

• Patients with MCI progress to AD at a rate of 10-15% per year
CERBROVASCULAR DISEASE

• Ischemic stroke
• Hemorrhagic stroke
• Vascular cognitive impairment and dementia.
ISCHEMIC STROKE
HEMORRHAGIC STROKE
VASCULAR COGNITIVE IMPAIRMENT

- Stroke affecting specific parts of the brain
- OR multiple, tiny, subclinical strokes leading to accumulation of damage.
RISK FACTORS

“MODIFIABLE VS NONMODIFIABLE”
MCI/DEMENTIA RISK FACTORS

- Age
- Family history/ genetics (ApoE4, APP, PSEN1, PSEN2)
- Hypertension
- Diabetes
- Cardiovascular disease
- High cholesterol
- Traumatic Brain Injury
- Obesity
- Low levels of mental and physical activity
- Decreased social engagement
- Poor dietary patterns
STROKE RISK FACTORS

- Age
- Sex
- Race/ethnicity
- High blood pressure
- High cholesterol (specifically LDL)
- Heart disease
- Previous stroke
- Diabetes
- Sickle cell disease and other blood disorders

- Unhealthy diet
- Physical inactivity
- Too much alcohol
- Obesity
- Smoking
MODIFIABLE RISK FACTORS

• Obesity
• Low levels of mental and physical activity
• Decreased social engagement
• Unhealthy diet
• Too much alcohol
• Smoking
PRESERVING BRAIN HEALTH

CONTROLLING THE RISK FACTORS
ALCOHOL

• No more than:
  • 1 drink a day for women
  • 2 drinks a day for men
• Increases heart attack and stroke risk
• Increases risk of falls/ injury
• Can cause permanent damage of specific parts of the brain
  • The cerebellum, important in balance and coordination
RESVERATROL

• In vitro studies: strong antioxidant, anti-inflammatory, anti-viral and anti-cancer capabilities

• In animal and in vitro studies helped to slow age-related cognitive decline and prevent dementia- but hasn’t been examined in humans yet
RESVERATROL

- Antioxidant found in grapes, berries, chocolate, peanuts and red wine
- also available as a supplement
RESVERATROL

• Doses btwn 20-2000mg/d have been used and were relatively safe short-term.

• Blood thinning properties- so be aware of additive effects with other medications that affect bleeding

• would have to drink between 200 and 650 glasses of red wine to get the amount of resveratrol in a 200 mg supplement capsule
Initial studies were conflicting!!

Increases risk for stroke and dementia

Increases cancer risk

Causes free radical damage to blood vessels, especially in the heart and the large arteries that supply blood to the brain
HEALTHY BODY WEIGHT

Midlife obesity (BMI > 30) shown to increase AD risk

• Individuals who are more than 20lbs overweight or more than 10% over ideal body weight have:
  • Up to 10X increase risk of developing diabetes’
  • 2-3X increase risk of severe atherosclerosis
  • And several times increased risk of stroke
METABOLIC SYNDROME

• HTN,
• DM2,
• Abdominal obesity,
• Dyslipidemia (low “good” cholesterol, high “bad” cholesterol)
• shown in many studies to be assoc with stroke, and cognitive decline in Alzheimer’s Disease
HEALTHY DIET

• Eating a healthy diet, specifically the Mediterranean diet, has been associated with decreased AD risk.

• Foods eaten as part of a healthy diet have benefits beyond just keeping weight down.


  • Looked at diet quality using the Alternative Healthy Eating Index. Found a lower risk of cog decline in those with the healthiest diets
• Eating a healthy diet
MEDITERRANEAN DIET

Mediterranean diet (fruit, veggies, whole grains, fish, olive oil, little red meat, low to mod red wine intake) can lower risk of heart attack, stroke, and Alzheimer’s disease.
• Eat a healthy diet
  • Lots of fruit and veggies
  • High in fiber
  • Lean Proteins
  • Limit sugar, trans fats, processed foods
  • Think *nutrient* dense, vs *calorie* dense
  • Saturated fat is not all bad!
DIETARY SUPPLEMENTS

• Efficacy

• Safety
  • Side effects and interaction with other drugs and medical conditions

• Bioavailability
  • Just because it goes into your mouth, doesn’t mean it’s getting to the target tissue.
DIETARY SUPPLEMENTS

- Cinnamon
- Bacopa
- Huperzine
- Berberine
- TA-65
- Lithium
- curcumin

- Flavanols (chocolate)
- Vitamin C&E
- Vitamin D
- Magnesium
- Cerbrolysin
- Omega 3s (DHA, EPA)
- Coffee
- Ginko Biloba
PHYSICAL ACTIVITY

• Several studies of healthy older ppl show physical activity improves cognitive function esp with regard to processing speed and cognitive function.

• There is evidence that physical activity prevents brain shrinkage
  • 565 healthy middle aged men and women
  • Found that greater physical fitness was associated with more brain volume measured 5 years later.

PHYSICAL ACTIVITY

• Stay active physically
  • 150 minutes of exercise per week (or 30 min, 5 days)
  • Exercise helps control body weight, maintain heart health, and maintain strength (helpful with fall prevention)
MENTAL ACTIVITY

• Evidence mounting that it is as important as physical activity!

• Low intellectual demand activities (watching TV) - are associated with increased risk of cognitive decline.

• “cognitive reserve”
“COGNITIVE RESERVE”

• Idea that individuals with higher levels of cognitive functioning and educational attainment can have same amount of disease pathology with less symptoms.

• Individuals with more education and occupational engagement are better able to cope with brain disease
“COGNITIVE RESERVE”

• Took ppl 75 or older and gave them MMSE in up to 6 waves. Then asked them about the type and level of mentally demanding work conditions in their former professional lives.

• High level of mentally demanding work tasks stimulating verbal intelligence and executive functions was significantly associated with a better cognitive function at baseline as well as lower rate of cog decline over 8 yrs of follow up.
“COGNITIVE RESERVE”

• “The results suggest that a professional life enriched with work tasks stimulating verbal intelligence and executive functions may help to sustain good cognitive functioning in old age (75+ yrs).”

A WORD ABOUT “BRAIN TRAINING”

• These things have not been proven to prevent Alzheimer’s disease
• People did have improvements in specific cognitive areas, but the effects seemed to be temporary.
• “insufficient evidence to support use”
SOCIAL ENGAGEMENT

• Larger social network, more emotional support, higher level of social engagement and social integration in late life shown to be associated with lower risk for dementia

• Volunteering

• Take/teach a class
SLEEP

• Important in memory, especially transforming short term into long term

• Sleep disorders affecting memory, AD and stroke risk:
  • Insomnia
  • Sleep disordered breathing (sleep apnea)
INSOMNIA

• Impaired memory and cognitive function in the short term
• Probably has long term effects too
• Insomnia has been associated with higher AD risk.
• Shorter sleep duration and poor sleep quality associated with chemical changes assoc with AD
SLEEP APNEA
SLEEP APNEA

• Short term (and likely long-term effects of insomnia)
• Plus:
  • Impaired glycemic control
  • Elevated blood pressure
  • Increased risk of arrhythmia
  • Increases risk of heart failure and heart attack
  • Increases stroke risk
SLEEP APNEA AND ALZHEIMER’S DISEASE

• Looked at patients with sleep disordered breathing
• Patients with SDB had younger age of onset of MCI
• But, comparing those who used CPAP treatment to those who didn’t,
  • CPAP use delayed onset of MCI by about 10 years in each group. Age 82 vs 72.

**MAKE SLEEP A PRIORITY**

- If any symptoms of sleep apnea, get a sleep study
  - Snoring
  - Morning headaches
  - Waking up choking/gasping
  - Feeling like suffocating when laying flat
  - Partner-witnessed apnea
  - Large neck circumference
  - Difficult to control diabetes or blood pressure
MAKE SLEEP A PRIORITY

• Practice Good sleep hygiene
  • Starts in the morning with early exposure to daylight
  • Exercise (not within 4 hours of bedtime)
  • Avoid stressful activities in the evening
  • Large meal 3 hours before bedtime
  • Light snack one hour before
  • Cool down
  • Avoid TV, computer, back-lit devices before bedtime
  • Bedroom for sleep and intimacy only
TRAUMATIC BRAIN INJURY

• Huge area of research (NFL, Veterans)

• Studies show that we see microscopic changes characteristic of AD as little as 2 hours after severe TBI.
• Diabetes—leads to damage of blood vessels throughout the body including the brain.
• Increases risk for heart disease and stroke. Almost doubles AD risk
  • “We found that hyperglycemia is associated with subtle brain injury and impaired attention and memory even in young adults, indicating that brain injury is an early manifestation of impaired glucose metabolism.”

OTHER MEDICAL CONDITIONS
OTHER MEDICAL CONDITIONS

- Heart disease
- High blood pressure - high blood pressure in mid life seems to be particularly important.
  - get BP checked regularly,
  - low sodium diet,
  - take meds as directed if needed.
OTHER MEDICAL CONDITIONS

• High cholesterol-conflicting data about whether it alone increase AD risk, but it does increase risk of cerebrovascular disease, which we know increases dementia risk.

• Liver disease
• Kidney disease
• Thyroid disease
MEDICATIONS

• Regularly evaluate all of your medications with your PCP
  • Sleep aids
  • Anxiety medications
  • Pain medications
MENTAL HEALTH

• Depression is definitely associated with Alzheimer’s disease, although it may not be causative.

• Depression and anxiety can definitely negatively impact cognitive function in anyone in the short term:
  • Impaired attention and concentration
  • Impaired memory
THE BIG PICTURE

• Brain health is dependent on overall health
• We DO have the power to take steps to promote brain health
• Even if we do have a higher risk to begin with, lifestyle choices DO make a difference.
  • Five recent studies: US, Netherlands, Sweden, England- all report declining incidence or prevalence of AD in those born later in the first half of the 20th century.
  • Plausible explanations: control of cerebrovascular RFs, better education, and improved economic well being.
THE BIG PICTURE

• Don’t smoke
• Don’t drink too much
• Eat a healthy diet
• Maintain healthy body weight
• Stay active mentally and physically
• Stay socially engaged
• Make sleep a priority
• Address other medical conditions
• Optimize medications
• Make mental health a priority
• Take steps to prevent falls and injury
LOCAL RESEARCH

• Arizona Alzheimer’s Consortium (AAC)
  • Banner Alzheimer’s Institute
  • University of Arizona
  • Arizona State University
  • Translational Genomics Research
  • Mayo Clinic
  • Barrow Neurological Institute
  • Banner Sun Health Research Institute

• Azalz.org for information about clinical trials
RESOURCES

• Healthy Brain Initiative http://www.cdc.gov/aging/healthybrain
• Alzheimer’s Drug Discovery Foundation www.alzdiscovery.org
• Us Dept of Health and Human Services Administration for Community Living www.acl.gov/Get_Help/BrainHealth
REFERENCES


• Breitner JCS and Galasko D; Encouraging trends toward reduced risk of Alzheimer disease: What's good for the heart is good for the brain. Neuro Clin Practice 2015;5:190-192

• CDC Healthy Brain Initiative: www.acl.gov/Get_Help/BrainHealth


