Cannabis and Health

Module 11: Neurocognitive/Brain Disorders Part I

Lecture 2: Epidemiology of MS, Epilepsy, Traumatic Brain Injury

Epidemiology of MS

- 400,000 people in the U.S. and about 2.5 million people worldwide are diagnosed with MS
- Onset is typically between the age of 20 and 40
- Women 2x more likely to be diagnosed then men
- Prevalence is higher Northern European and northern North American regions (~ 30 per 100,000)
- Prevalence has been increasing over time (maybe because people are living longer)

Epidemiology of Epilepsy

- Epilepsy affects at least 50 million people worldwide
  - one of the most common neurological diseases
- Affects approximately 2.3 million U.S. adults
- Nearly 80% of people with epilepsy live in low- and middle-income countries
- About 75% of people with epilepsy in low- and middle-income countries do not get the treatment they need
- Up to 10% of people worldwide have one seizure during their lifetime
  - At least 2 unprovoked seizures are needed to diagnose epilepsy

World Health Organization: https://www.who.int/news-room/fact-sheets/detail/epilepsy

Epidemiology of Epilepsy

- The estimated proportion of general population with active epilepsy at a given time is between 4 and 10 per 1000 people.
- Studies in low- and middle-income countries suggest that the proportion is much higher, between 7 and 14 per 1000 people
- Globally, an estimated 2.4 million people are diagnosed with epilepsy each year

Comorbidities and Complications of Epilepsy

- Mood disorders
  - anxiety and depression are common
- Headache, migraine, other types of pain
- Sleep disorders
- Neurocognitive disorders
- Cardiovascular conditions (high blood pressure, stroke)
- Respiratory conditions (asthma, chronic bronchitis)
- Metabolic disorders
- Inflammatory disorders (arthritis, dermatitis)

CDC: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6243a2.htm

Epilepsy: Some Known Risk Factors

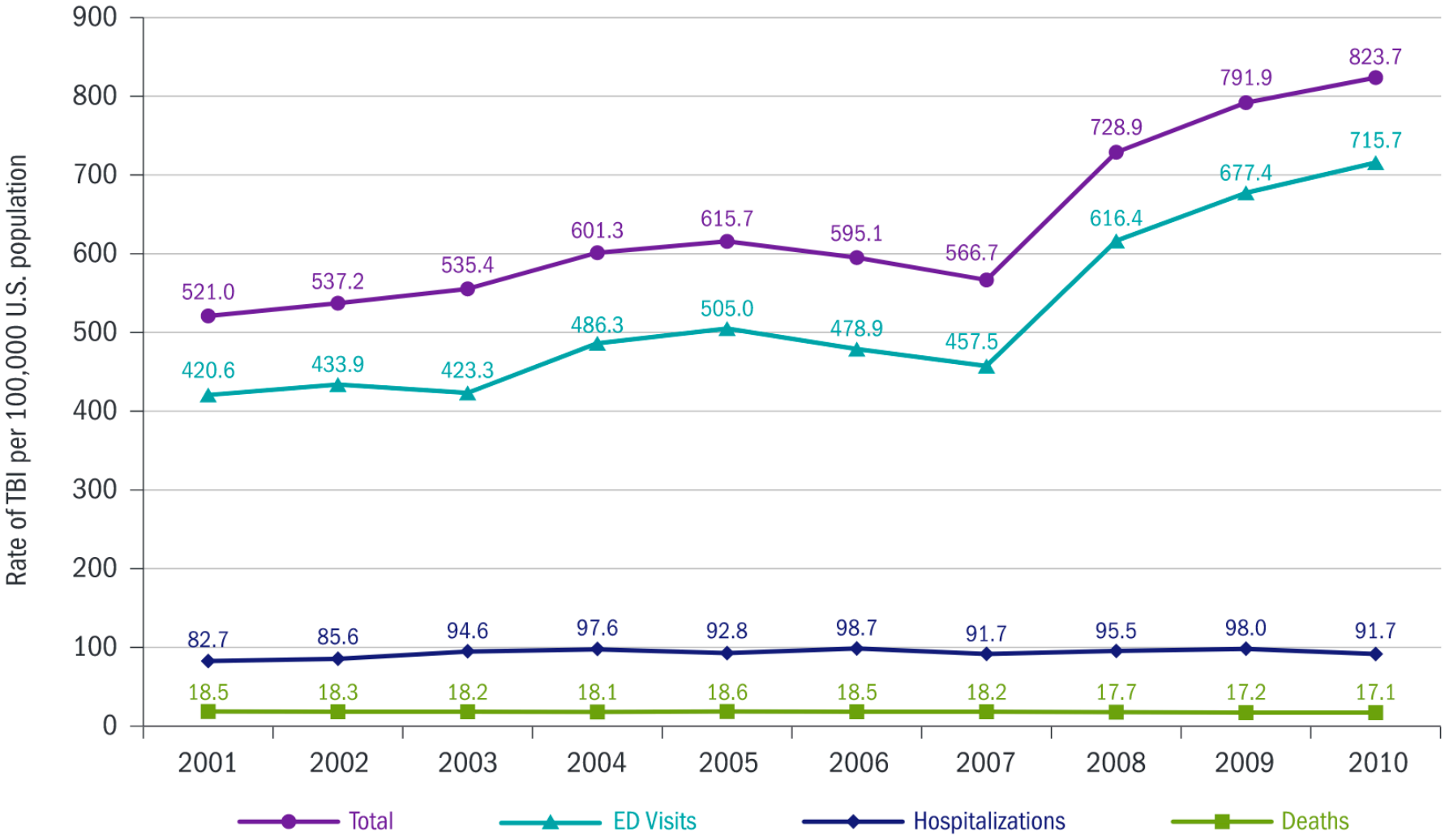
- Causes of epilepsy not completely understood, but risk factors include:
  - Babies who are born small for their age
  - Babies who have seizures in the first month of life
  - Bleeding into the brain
  - Serious brain injury or lack of oxygen to the brain
  - Brain tumors Infections of the brain
  - Stroke resulting from blockage of arteries
  - Cerebral palsy
  - Conditions with intellectual and developmental disabilities
  - Family history of epilepsy or fever-related seizures
  - Alzheimer's disease (late in the illness)
  - Autism spectrum disorder

Epidemiology of TBI in the United States

- In 2010, the CDC estimated that TBIs accounted for ~2.5 million ED visits, hospitalizations, and deaths in the U.S.
  - 87% treated and released from EDs
  - 11% hospitalized and discharged
  - 2% died
- These numbers underestimate occurrence of TBIs
  - Don’t account for people who did not receive medical care, had outpatient or office-based visits, or received care at the VA
- Dept. of Defense data: from 2000 through 2011
  - 235,046 service members (or 4.2% of people who served in the Army, Air Force, Navy, and Marine Corps) were diagnosed with TBI

Centers for Disease Control and Prevention. (2015).
Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation

Figure 1. Annual age-adjusted rates of TBI-related Emergency Department (ED) visits, hospitalizations, and deaths—United States, 2001–2010



Epidemiology of TBI in the United States

- Children 0–4 years, adolescents 15–19 years, and adults 75 years older are most likely to have TBI-related ED visit or be hospitalized for TBI
- Adults 75 years older have highest rates of TBI-related hospitalizations and deaths among all age groups
- Leading causes of non-fatal TBI in the U.S. are falls (35%), motor vehicle-related injuries (17%), and strikes or blows to the head (17%)
- Leading causes of TBI-related deaths are motor vehicle crashes, suicides, and falls

Centers for Disease Control and Prevention. (2015).
Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation

Public Health Impact of TBI

- Estimates indicate that 3.2–5.3 million people in the U.S. are living with TBI-related disability
- Adolescents and adults with moderate or severe TBI more than twice as likely to die 3.5 years after injury
- Among adolescents and adults who received rehabilitation for TBI, 2/10 will have died at 5 years post-injury, and nearly 4/10 will have declined in function

Centers for Disease Control and Prevention. (2015).
Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation

Public Health Impact of TBI

- TBI can adversely affect a person's quality of life
  - cognitive, behavioral/emotional, physical effects that affect interpersonal, social and occupational functioning
- TBI can negatively affect families
  - caregiver distress, depression, and deterioration of family functioning after TBI
- TBI can negatively effect communities and the economy
  - Impaired community participation
  - Difficulty securing/maintaining employment
  - High medical costs for some people with TBI

Centers for Disease Control and Prevention. (2015).
Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation

Co-morbidities and Complications of TBI

- seizures
- sleep disturbance
- fatigue
- infections
- neurodegenerative disease
- neuroendocrine dysregulation
- psychiatric disorders
  - depression, anxiety, substance use disorders
- chronic pain or headache

Factors Influencing TBI Outcomes

- type and severity of TBI
- medical care received
- age
- pre-injury functioning
- socioeconomic status
- social support
- caregiver and family functioning
- access to rehabilitation services
  - lack of specialty providers
  - lack of financial resources
  - level of insurance coverage

Centers for Disease Control and Prevention. (2015).
Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation

Conclusions

- MS impacts about 2.5 million people worldwide and women are 2.5x likely to have MS
- Epilepsy impacts about 2.4 million people worldwide
- CDC estimates that TBI involve in over 2.4 million hospital ED visits per year in the U.S. alone