Prevention of Epilepsy

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Concepts of Prevention

- Primary Prevention
  - Measures to prevent the initial occurrence of a disease
    - Reduction of incidence through control of causes (risk factors)
      - Smoking and lung cancer
      - Immunization and measles
      - **Sanitary infrastructure and taeniasis and cysticercosis**

Concepts of Prevention

- Secondary Prevention
  - Measures to stop or slow the progression of a disease and reduce risk for chronicity
    - Applicable if the disease has identified risk factors or
    - Abnormal conditions that precede the emergence of the disease
    - Reduce the prevalence of a disease
      - Breast and cervical cancer screening
      - Hypertension treatment and stroke
      - Screening for inborn errors of metabolism (PKU)
    - Identification of antiepileptogenic treatments in stroke or TBI

Concepts of Prevention

- Tertiary Prevention
  - Measures to prevent or reduce the impact of adverse events occurring as a consequence of the disease
    - Rehabilitation following traumatic brain injury
    - Antiplatelet use after an embolic stroke
    - Evaluation for peripheral neuropathy in people with diabetes
    - **Monitoring blood levels of AED to prevent toxicity**

Concepts of Prevention

- Primordial Prevention
  - Measures to prevent the emergence and establishment of environmental, social, and economic factors associated with disease
    - Diet and life style
    - Enhancement of sanitary conditions

Strategies For effective prevention

- Largest yield for efforts with
  - High population prevalence
  - Low risk ratios
    - But little benefit to individual
- May also target high risk populations
  - Low impact on overall disease prevalence
    - But identifiable benefit to individual

Risk factors for epilepsy

- THE MAJORITY OF PEOPLE WITH NEW ONSET EPILEPSY HAVE NO IDENTIFIED CAUSE.
- Most of the identified risk factors for epilepsy have an exceedingly high risk in epidemiologic terms, but affect a relatively small proportion of the population.
  - Severe TBI 20
  - Stroke 10-20
  - CNS infection

For effective prevention

- Few known conditions considered risk factors for epilepsy meet this criteria
  - Alcohol abuse RR 3 but population frequency 10%
  - Hypertension high risk for uncontrolled but low population prevalence. Little effect with low grade or controlled BP

  - Depression RR 3 to 6, population frequency 10%
  - Migraine with Aura RR 10, population frequency 5%
  - But for these conditions bidirectionality a problem

Lung Cancer and Smoking VS TBI and epilepsy

- SMOKING AND LUNG CANCER
  - RR of 3—not readily identifiable clinically—but
  - Dose relationship
  - Duration relationship
  - High population prevalence use (85% in control group)—hence major impact on incidence with modification
- TBI and Epilepsy
  - RR of 20 readily identifiable clinically
  - Low population incidence prevalence (<1%)
  - Different mechanisms in different communities

Primary Prevention of epilepsy
the case for immunization

- Incidence of epilepsy in children—decreased 40% between 1940 and 1980 largely unexplained
  - before immunization 99% acquire measles
  - Encephalitis in 1/1000 measles case
  - 20% of encephalitis cases develop epilepsy
- Currently 1000 new cases prevented annually (of 175,000)

Future strategies

- Identification of highly prevalent risk factors
  - Incident case control studies
- Better understanding antecedents of bidirectional factors
- Evaluation of differences in at risk populations of those who do and do not get epilepsy
  - Neurocysticercosis for example.