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)
Cysticercosis and Epilepsy in Ecuador

- Population prevalence of seropositivity  20%
- RR for epilepsy  3
- Incidence of epilepsy  170/100,000
- New Cases/ year  25,000
- Number attributable to cystercosis  15,000
- Theoretically up to a 60% reduction in the annual incidence
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.