Seasonal primary amebic meningoencephalitis (PAM) in the south: Summertime is PAM time

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Abstract: Primary amebic meningoencephalitis (PAM), a typically fatal, free-living amebic infection of the central nervous system (CNS), is caused by the thermophilic, freshwater protozoan, Naegleria fowleri. More than 145 cases of PAM have been reported worldwide, with most reported cases in the United States (US). Since annual PAM case clusters in the US and worldwide have demonstrated recent increases over background cases, the objectives of this investigation included (1) an epidemiological and statistical analysis of a 2007 cluster of six PAM cases in the southern US, nested in a retrospective review of 121 confirmed US cases of PAM over the period, 1937 to 2007; and (2) a statistical analysis of all existing demographic, temporal, and behavioral risk factors for PAM. Significant risk factors for PAM in the United States included male sex and warm recreational freshwater exposures in seasonal patterns (July - August) in southern tier states, including Louisiana. Although there have been a few recent survivors of PAM treated with combinations of intensive critical care, antifungals, and synergistic antibiotics, case fatality rates for PAM remain very high. PAM is best prevented by combinations of public health educational and behavioral modification strategies. Further investigations will be required to determine the significance of freshwater wakeboarding as a significant risk factor for PAM and to determine any dose-response effects of global warming on rising freshwater temperatures and the growth of aquatic Naegleria fowleri.

Resource Description

Exposure
  Water Quality
  ● Water Quality: Marine/Freshwater Pathogen

Geographic Feature
  Freshwater

Geographic Location
  United States
Health Impact
  Infectious Disease
    • Infectious Disease: Waterborne Disease

Resource Type
  Review Article

Special Topic
  Adaptation, Communication
    • Adaptation: Adaptation Co-Benefit/Co-Harm, Intervention
    • Communication: General Public/Unspecified