Introduction

- Status epilepticus (SE) is a life-threatening neurologic emergency with significant morbidity and mortality, defined as continuous or intermittent seizures with incomplete recovery of consciousness. SE may be refractory (RSE) to first- and second-line therapies in ~25% of patients. Approximately 41% of RSE patients suffer from super-refractory SE (SRSE), defined as SE that continues or recurs 24 hours or more after the onset of anesthetic therapy.

- There are no published estimates of the prevalence of SE and its subtypes; all available epidemiological data are for disease incidence.

Objective

- The objective of this study is to calculate the prevalence of SE, RSE, and SRSE using an incidence-survival model.

Materials and Methods

- SE incidence data were obtained from Hesdorffer et al (1998)\(^1\). This study was based on 20 years of retrospective data, and was not skewed by an abnormally large non-white underlying population, which may have affected results from other SE epidemiology studies\(^2,3\).

- Age-adjusted incidence rates were obtained for each SE etiology: acute symptomatic, progressive symptomatic, remote symptomatic, and idiopathic/cryptogenic. Incident cases were calculated for each etiology beginning with 1995. Each yearly total was reduced by 16% to account for patients that die within 30 days of their first SE episode.

- Yearly survival data were extrapolated for each SE etiology from a Kaplan-Meier survival curve by Ristić et al (2010)\(^4\) (Fig 1).

- Prevalence for each etiology was calculated by multiplying the year-specific survival proportion by the age-adjusted incident cases, repeated in an overlapping method from 1995 to 2015, where each year’s incident cases are added to prevalent cases carried over from prior years. This was repeated until 2015 in the model, when all year-specific survival proportions were accounted for, and 2015 to 2024 represent a complete estimate of the prevalent population. An example of how the model was built for each etiology is shown in Figure 2.

- Total SE prevalence was calculated as the sum of each individual etiology prevalence.

- RSE and SRSE prevalent cases were assessed as proportions of the total number of prevalent SE cases, based on published values.

Results

- The prevalence of SE was calculated to be 17.6 cases per 10,000 population in the United States, resulting in 566,241 cases in 2015 and increasing to 606,004 cases in 2024.

- Progressive symptomatic SE had the lowest prevalence, 1.04 cases per 10,000 population, resulting in 33,422 cases in 2015 and increasing to 35,769 cases in 2024.

- Acute symptomatic SE had the highest prevalence, 10.0 cases per 10,000 population, resulting in 321,041 cases in 2015 and increasing to 343,586 cases in 2024. Acute symptomatic SE prevalent cases represented 56.7% of the total prevalent SE cases.

- The prevalence of RSE was 4.3 cases per 10,000 population, resulting in 139,295 cases in 2015 and increasing to 149,077 cases in 2024. SRSE prevalence was 1.8 per 10,000 population, resulting in 56,624 cases in 2015 and increasing to 60,604 cases in 2024.

Conclusion

- To our knowledge, this is the first attempt to calculate the prevalence of SE and its subtypes for all ages in the United States.

- Estimating the prevalence of SE, RSE, and SRSE using population-based epidemiological methods is challenging because of the variability of SE disease definitions and the unpredictable nature of mortality due to SE. This incidence-survival model provides an alternate and effective method to assess the prevalent population.

- Considering the high costs associated with treatment and hospitalization of SE, RSE, and SRSE patients, these estimates are necessary to quantify the burden of disease in the United States.

References


Contact Info

Mark Stuntz
Deerfield Institute
780 Third Avenue
37th floor
New York, NY 10017
mstuntz@deerfield.com

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