Prevalence of epilepsy in rural Kansas

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Summary

Purpose: To determine the prevalence of active epilepsy in two southeastern rural Kansas counties.

Methods: Medical records were abstracted from the emergency rooms, out- and inpatient services and clinics of 9 hospitals, from 10 doctors' offices, and 1 nursing home in and surrounding the two counties. Letters were mailed from hospitals and doctors' offices to invite their potentially eligible patients to participate in an interview. Medical record information and the interview, when available, were used for the final determination of active epilepsy, seizure type, etiology, syndrome, age, and gender in consensus conferences. Prevalence of epilepsy was calculated, and capture—recapture methodology, which estimates prevalence based on what is known about the population, was employed to assess active epilepsy in the two counties.

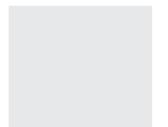*Results:* This study identified 404 individuals with active prevalent epilepsy who visited at least one of the 20 facilities during the observation period. The overall prevalence of active epilepsy was 7.2 per 1000. The seizure type for 71.3% of prevalent cases was unknown; among the 76 cases with known and classifiable seizure type, 55.3% had focal with secondary generalized seizures. Among the 222 cases with classifiable etiology, 53.1% were idiopathic/cryptogenic. About 75% (n = 301) were captured at only one center, 72% (n = 75) of the remaining 103 patients were captured at two centers, and 28 patients were identified at three or more centers. The

capture—recapture assessment yielded an estimation of 982 prevalent patients. The overall estimated prevalence of epilepsy in the two Kansas counties using capture—recapture was 17 per 1000.

Conclusions: The crude prevalence of epilepsy, using medical record survey methods, was similar to, but on the high end, of other total population prevalence studies in the United States. The capture—recapture assessment suggested that epilepsy prevalence might be considerably higher than the crude prevalence.

Background

Epilepsy is among the most common of all neurologic conditions (U.S. Department of Health and Human Services, 2008). There are an estimated 50 million people with epilepsy in the world (WHO, 2012), with an estimated prevalence of active epilepsy of 4—7 per 1000 persons in developed countries (Sander, 2003) and 5—74 per 1000 persons in developing countries (Preux and Druet-Cabanc, 2005; Ngugi et al., 2010). In the United States, an estimated 2.2 million individuals have epilepsy (Institute of Medicine, 2012).

As a spectrum disease with symptoms that may mimic other conditions, epilepsy can be especially difficult to diagnose, making an accurate census of the disease even more of a challenge. Beyond difficulties inherent in diagnosing the condition itself, the logistic realities of determining the prevalence of epilepsy in a given region serve as impediments to determining widespread and reliable prevalence estimates for epilepsy. Because of the time and expense of such efforts, rural and other at-risk populations are less likely to be canvassed in a manner to reliably determine prevalence (Asawavichienjinda et al., 2002).

Despite the inherent difficulties in determining prevalence, there exists a large body of literature centered on epilepsy prevalence across the world. In the large number of studies (more than 5000 since 1965) (Banerjee et al., 2009) conducted on the epidemiology of epilepsy and the wide variety of methodologies used and areas studied, studies of urban communities have predominated (Benn et al., 2009; Kelvin et al., 2007). Rural communities in the United States remain under-studied for epilepsy prevalence. Although most studies focus on urban populations in the United States, epilepsy is estimated to be more prevalent in rural communities than in urban communities (Haerer et al., 1986; Hollingsworth, 1978; Baumann et al., 1977).

Studies of rural populations worldwide have suggested epilepsy prevalence between 2.7 per 1000 in Italy (Reggio et al., 1996) and 17.6 per 1000 in Chile (Lavados et al., 1992). Prevalence varies dramatically by region and often corresponds to the countries' degree of development or industrialization (Strzelczyk et al., 2008). Within countries, epilepsy can be as much as twice as common in rural areas than urban areas (Gourie-Devi et al., 2004; Aziz et al., 1997). Few rural, population-based prevalence studies have been conducted in the United States. Moreover, studies that have included racially and ethnically diverse populations suggest a higher prevalence in minorities, yet these studies have generally been of both minority and of low socio-economic status populations, and there have been few attempts to separate these factors. The current study sought to determine the prevalence of active epilepsy in two rural, predominantly Caucasian southeastern Kansas counties for the year 2008.

Methods

Labette and Montgomery counties were selected for this study because of their rural, low socio-economic status, and predominately Caucasian population.

Labette County

According to the 2000 census (United States Census Bureau, 2001a), there were 22,835 people (51.1% female) in Labette County. The median income for a household in the county was $30,875, the per capita income was $15,525, and 12.7% of the population was below the poverty line. The racial makeup of the county was 89.3% White and 4.7% Black or African American, and 3.1% of the population was Hispanic or Latino.

Montgomery County

There were 36,252 people (51.8% female) in Montgomery County (United States Census Bureau, 2001b). The median income for a household in the county was $30,997, the per capita income was $16,421, and 12.60% of the population was below the poverty line. The racial makeup of the county was 85.8% White and 6.1% Black or African American, and 3.1% of the population was Hispanic or Latino.

For 2006—2010, the percent of persons 25 years and older with a bachelor's degree or higher was 17.8% in Labette County and 18.6% in Montgomery County; these are considerably lower than the United States' average (29.3%) (United States Census Bureau, 2012a,b,c).

Definitions

Epilepsy was defined as a condition manifest by recurrent unprovoked epileptic seizures. Active epilepsy was defined as having a history of recurrent, unprovoked seizures and having at least one unprovoked seizure or having taken anticonvulsant medication within five years of the prevalence year of 2008 (Hauser et al., 1991).

Procedures

Those with active epilepsy in 2008 were identified at one or more of 20 hospitals, clinics, doctors' offices, or a nursing home either in the two counties or at presumed epilepsy specialist referral centers ''near'' (within 300 miles) these