

# An estimate of the prevalence of psychogenic non-epileptic seizures

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The prevalence of psychogenic non-epileptic seizures is difficult to estimate. We propose an estimate based on a calculation. We used the following data, which are known or have been estimated, and are generally accepted. A prevalence of epilepsy of 0.5–1%; a proportion of intractable epilepsy of 20–30%; a percentage of these referred to epilepsy centers of 20–50%; and a percentage of patients referred to epilepsy centers that are psychogenic non-epileptic seizures: 10–20%. Using the low estimates, the prevalence of psychogenic non-epileptic seizures would be 1/50 000. Using the high estimates, the prevalence of psychogenic non-epileptic seizures would be 1/3000. The prevalence of psychogenic non-epileptic seizures is somewhere between 1/50 000 and 1/3000, or 2 to 33 per 100 000, making it a significant neurologic condition.

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## INTRODUCTION

Psychogenic non-epileptic seizures (PNES) are commonly seen at epilepsy centers, where they may represent 10–22% of referrals<sup>1,2</sup>. Other estimates conclude that PNES would be found in 5–20% of outpatient epilepsy populations<sup>1,3</sup>. However, the prevalence of PNES in the general population is unknown. We propose an estimation of the prevalence of PNES based on extrapolation from available incidence, prevalence, and hospital-based data.

## METHODS

We used the following data, which are known or have been estimated, and are generally accepted. The prevalence of epilepsy is 0.5–1%<sup>4</sup>. The proportion of intractable epilepsy is 20–30%<sup>5,6</sup>. The percentage referred to epilepsy centers: 20–55%<sup>5,7</sup>. The percentage of epilepsy centers that are found to have PNES: 10–20%<sup>1,2</sup>. The prevalence of PNES can then be calculated to be the product of the four percentages.

## RESULTS

### Based on the *low* estimates

Using a prevalence of epilepsy of 0.5%, a proportion of patients with intractable epilepsy of 20% of patients with epilepsy, a proportion of such patients referred to epilepsy centers of 20%, and the proportion of such patients found to have PNES of 10%, the prevalence of PNES would be 10% of 20% of 20% of 0.5% =  $1/10 \times 1/5 \times 1/5 \times 1/200 = 1/50\,000$ .

### Based on the *high* estimates

Using a prevalence of epilepsy of 1%, a proportion of patients with intractable epilepsy of 30% of patients with epilepsy, a proportion of such patients referred to epilepsy centers of 50, and the proportion of such patients found to have PNES of 20%, the prevalence of PNES would be 20% of 50% of 30% of 1% =  $1/5 \times 1/2 \times 1/3 \times 1/100 = 1/3000$

## DISCUSSION

PNES certainly seem like a common problem to the epileptologist, but there is no good estimate of their prevalence in the general population. This is important to allow comparison with other neurologic disorders. Our estimated prevalence of PNES is 1/50 000 to 1/3000 population, or 2 to 33 per 100 000.

The annual incidence of PNES was found to be 1.4 per 100 000<sup>8</sup>. In a similar population, the annual incidence of epilepsy was found to be 47 per 100 000<sup>9</sup>. Assuming a comparable duration of illness between epilepsy and PNES, this would yield a prevalence of PNES of  $(1.4/47) \times 1/100 = 0.03\% = 30$  per 100 000, a number consistent with our estimate.

Estimates of the prevalence of conversion disorder are difficult and scant, but certainly much higher than this. Studies in specific populations have yielded impressively high numbers. For example, Lempert *et al.*<sup>10</sup> found that 9% of neurologic inpatients had psychogenic rather than organic symptoms. Psychogenic symptoms may account for 1% of all neurologic diagnoses<sup>11</sup>, and were also found in 5.5% of patients with anxiety disorders<sup>12</sup>. Since PNES are a specific subtype of conversion disorder<sup>13</sup>, and represent a small fraction of somatoform disorders at large, it is logical that the prevalence and incidence of PNES is far less than those estimates. One also has to remember that psychogenic symptoms can simulate almost any condition, and are therefore seen by all specialists. However, psychogenic seizures have the unique feature that they can be proven to be psychogenic with almost certainty, which is not the case in many other specialties.

We recognize that our estimate represent a rather wide range, but it at least estimates the burden of PNES to be comparable in prevalence to, for example, multiple sclerosis or trigeminal neuralgia, and probably higher than, for example, Guillain-Barré syn-

drome or myasthenia<sup>14</sup>.

## REFERENCES

1. Scoot, D. F. Recognition and diagnostic aspects of non-epileptic seizures. In: *Pseudoseizures*. (Eds T. L. Riley and A. Roy). Baltimore, Williams & Wilkins Co., 1982: pp. 21–34.
2. Gates, J. R., Ramani, V., Whalen, S. and Loewenson, R. N. Ictal characteristics of pseudoseizures. *Archives of Neurology* 1985; **42**: 1183–1187.
3. Krumholz, A. and Niedermeyer, E. Psychogenic seizures: a clinical study with follow up data. *Neurology* 1983; **33**: 498–502.
4. Hauser, W. A. and Hesdorffer, D. H. *Epilepsy: Frequency, Causes and Consequences*. New York, NY, Demos Press, 1990.
5. Engel, J. Jr. and Shewmon, D. A. Overview: who should be considered a surgical candidate? In: *Surgical Treatment of Epilepsies. 2<sup>nd</sup> Edition*. (Ed. J. Jr. Engel). New York, NY, Raven Press, 1993: pp. 23–34.
6. Mattson, R. H. Value of intensive monitoring. In: *Advances in Epileptology. Xth Epilepsy International Symposium*. (Eds J. A. Wada and J. K. Penry). New York, Raven Press, 1980: pp. 43–51.
7. Engel, J. Jr. Surgery for seizures. *New England Journal of Medicine* 1996; **334**: 647–652.
8. Sigudadottir, K. R. and Olafsson, E. Incidence of psychogenic seizures in adults: a population-based study in Iceland. *Epilepsia* 1998; **39**: 749–752.
9. Olafsson, E., Hauser, W. A. and Ludvigsson, P. Incidence of epilepsy in rural Iceland: a population-based study. *Epilepsia* 1996; **37**: 951–955.
10. Lempert, T., Dietrich, M., Huppert, D. and Brandt, T. Psychogenic disorders in neurology: frequency and clinical spectrum. *Acta Neurologica Scandinavica* 1990; **82**: 335–340.
11. Marsden, C. S. Hysteria—a neurologist's view. *Psychological Medicine* 1986; **16**: 277–288.
12. Rogers, M. P., Weinschenker, N. J., Warshaw, M. G., Goisman, R. M., Rodriguez-Villa, F. J., Fierman, E. J. and Keller, M. B. Prevalence of somatoform disorders in a large sample of patients with anxiety disorders. *Psychosomatics* 1996; **37**: 17–22.
13. American Psychiatric Association, *American Psychiatric Association's Diagnostic and Statistics Manual (DSM-IV)*. 1994.
14. Kurtzke, J. F. The current neurologic burden of illness and injury in the United States. *Neurology* 1982; **32**: 1207–1214.