

Epidemiological Research on Stroke in Spain. Population-Based Studies or Use of Estimates From the Minimum Basic Data Set?

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The present issue of *Revista Española de Cardiología* publishes an epidemiologic estimate of stroke incidence in Catalonia constructed from the Minimum Basic Data Set (MBDS), compulsory in all Spanish hospitals.¹ The MBDS is a valuable resource for healthcare planning providing data on the volume and nature of hospital use. The interest of this article lies in whether or not the estimate constitutes an epidemiologic resource that is adequate enough to enable us to establish the frequency of stroke, bearing in mind the changes in healthcare attention for cerebrovascular disease in the last decade, and permit us to change criteria for research into the epidemiology of stroke.²

The epidemiology of stroke has been marked by methodological discrepancies. The question of whether geographical or racial differences exist in different populations and the repercussion of population-wide interventions into risk factors affecting incidence obliged researchers to make the epidemiologic data available easy to compare. In 1987, Malmgrem et al,³ who participated in the Oxford study, established what they called ideal criteria for the analysis of the epidemiology of stroke, which obliged interventionist population-based studies to guarantee complete selection as they considered data from hospital registries and the registry of deaths were insufficient and impeded the comparison of studies. In contrast, Marrugat et al¹ moved in the opposite direction as they assumed the MBDS draws on such a wide catchment area that it guarantees adequate selection.

Various questions should be borne in mind on comparing data reported by Marrugat et al¹ with the literature. Firstly, Marrugat et al include all episodes of stroke as they do not establish whether patients who may

have been admitted on several occasions or prior to 2002, were excluded. Stroke is an illness and, essentially, we are not interested in the episodes but the population at risk. Consequently, most population-based studies only include specifically patients with first-ever stroke, as incident cases, as a new episode in a patient who has experienced one before does not mean the onset of the illness. So, on comparing data reported by Marrugat et al¹ with population-based studies this must be borne in mind.

A second important issue is the length of the study. Malmgrem et al³ consider epidemiologic studies should have a 5 year duration at least, given seasonal differences in the presentation of episodes. This limitation means few population-based studies are considered ideal and, although a period this long is probably excessive, just 1 year may be too short a period. In-hospital experience tells us there are periods when incidence varies and, therefore, the length of the study should probably be greater in order to bring us closer to a real estimate.

Finally, the context of the study population is very large. Large population-based denominators enable us to reduce confidence intervals and present apparently closely-adjusted figures. However, these inevitably lead to a fall in the intensity of recruitment, which means they usually entail low rates. Furthermore, comparisons with other studies are also difficult to establish because data are not adjusted to a standard population.

In Spain, we do not have access to ideal epidemiologic studies of stroke. Most of the information available is based on hospital registries, door-to-door interviews in the population at large by sampling, or from the registry of deaths. Sources of data that almost fulfill the requirements of ideal studies, like the Requena or Alcoi studies, are unpublished. The population-based Alcoi study, conducted in the area around Cocentaina in 1989, lasted 1 year, not 5. The most complete study was made in Segovia, but this was based on patients with reversible stroke.⁴ This study found 150 new cases per 100 000 population in 1 year (Table), whereas Marrugat et al¹ reported higher figures, perhaps because they included all patients with stroke. The Oxford Vascular Study⁵ found 160 new cases per 100 000 population, although overall

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Incidence ($\times 1000/\text{Year}$) of First-Ever Stroke According to Malmgrem's Criteria in Cocentaina (Around Alcoi, Alicante)

55-64	65-74	>75	75-84	>85	Incidence/1000
0.9	5.0	17.6	15.7	26.3	1.5

incidence has been falling in the last 20 years. An interesting point of comparison is that whereas population-based studies, like the Alcoi data, show a marked increase in incidence in the 75-84 year-old subgroup, in patients of >85 years, according to Marrugat et al,¹ the rate falls. This leads us to believe the method employed does not permit us to detect cases in this age group adequately. Finally, the way the estimate is made prevents us from learning the epidemiology of stroke subtypes, information relevant to establishing comparisons given the different influence of the risk factors.^{6,7}

However, the most important question is: Can data obtained via the MBDS give an adequate estimate on the frequency of stroke? Or, what amounts to the same question: Is the selection provided by hospital registries today sufficiently wide-reaching given the social changes and campaigns that insist on the hospitalization of patients with stroke? Clearly, in the 1980s, the frequency of admissions for stroke was low and biased as older patients remained at home. The existence of so-called "therapeutic nihilism" in many groups of physicians attending cerebrovascular patients and, more extensively, in the general population, made it difficult to gain access to acute care in hospitals. Most families will recall the experience of patients with stroke who remained at home without any special attention. Consequently, incidence figures drawn from hospital registries were kept low. Today, this situation cannot possibly be justified. Most patients with stroke are admitted and only those with recurrent strokes, or of very advanced age, and with very bad prognosis may not be included in hospital registries. Thus, data obtained from these sources today should be highly accurate. Therefore, the MBDS should be

considered an extremely valuable resource, at a much lower cost than a population-based study.

Nonetheless, epidemiology is methodology and should be conducted with precision. We believe that, like any methodological instrument, the MBDS should be adequately validated as a research resource. The MBDS comes from clinical records and is completed by personnel in units of admission whose motivation may vary greatly. These data are also used to calculate hospital attendance so as to estimate productivity. Therefore, the MBDS was not set up as an instrument to promote diagnostic precision.

The estimate of stroke incidence reported by Marrugat et al¹ should not differ greatly from the rate that a population-based study would find, despite the differences we have mentioned, and is therefore a good approximation that should be replicated in other geographic areas.

REFERENCES

- Marrugat J, Arboix A, Garcia-Eroles LL, Salas T, Vila J, Castell C, et al. Estimación de la incidencia poblacional y letalidad de la vascular establecida isquémica y hemorrágica en 2002. *Rev Esp Cardiol.* 2007;60:573-80.
- Kurtzke JF. Epidemiology of stroke: methods and trends. *Health Rep.* 1994;6:13-21.
- Malmgrem R, Warlow C, Bamford J, Sandecork P. Geographical and secular trends in stroke incidence. *Lancet.* 1987;2:1197-8.
- Sempere AP, Duarte J, Cabezas C, Clavería LC. Incidence of transient ischemic attacks and minor ischemic strokes in Segovia, Spain. *Stroke.* 1996;27:667-71.
- Rothwell PM, Coull AJ, Giles MF, Howard SC, Silver LE, Bull LM, et al. Change in stroke incidence, mortality, case-fatality, severity, and risk factors in Oxfordshire, UK from 1981 to 2004 (Oxford Vascular Study). *Lancet.* 2004;363:1925-33.
- Rothwell PM, Coull AJ, Silver LE, Fairhead JF, Giles MF, Lovelock CE, et al. Population-based study of event-rate, incidence, case fatality, and mortality for all acute vascular events in all arterial territories (Oxford Vascular Study). *Lancet.* 2005;366:1773-83.
- Di Carlo A, Lamassa M, Baldereschi M, Pracucci G, Consoli D, Wolfe CD, et al. Risk factors and outcome of subtypes of ischemic stroke. Data from a multicenter multinational hospital-based registry. The European Community Stroke Project. *J Neurol Sci.* 2006;244:143-50.