

## Australia's seizure divide – indigenous versus non-indigenous seizure hospitalization

Chris Plummer<sup>a,\*</sup>, Mark J. Cook<sup>a</sup>, Ian Anderson<sup>b</sup>, Wendy J. D'Souza<sup>a</sup>

<sup>a</sup> Department of Medicine, St Vincent's Hospital Melbourne, The University of Melbourne, P.O. Box 2900, Fitzroy, Victoria 3065, Australia

<sup>b</sup> Murrup Barak Melbourne Institute for indigenous Development Population Health, University of Melbourne, Grattan Street, Parkville, Melbourne, Victoria 3052, Australia

### ARTICLE INFO

#### Article history:

Received 24 August 2013

Revised 26 September 2013

Accepted 29 September 2013

Available online 5 November 2013

#### Keywords:

Australia

Indigenous

Non-indigenous

Seizure hospitalization

### ABSTRACT

Indigenous Australians suffer the highest mortality and morbidity rates of any ethnic minority in the developed world. To determine if the health outcome gap between indigenous and non-indigenous Australians also applied to seizures, we conducted a retrospective analysis of seizure hospitalization (1998–2004) based on ethnicity (indigenous (I) and non-indigenous (NI)) for four Australian jurisdictions – Northern Territory (NT), Queensland (Qld), South Australia (SA), and Western Australia (WA). Total admissions were converted to age-standardized rates (ASR) and I/NI ASR ratios (I/NI<sub>RR</sub>) and compared across multiple variables. The summed admission (combined jurisdictions over six years) was 71,185 (I = 11,593 and NI = 59,592). Seizure hospitalization rate was always higher in the indigenous population (six-year I/NI<sub>RR</sub> – NT = 5.6, Qld = 4.0, SA = 6.4, and WA = 10.9; combined jurisdictions = 5.6). Disparity was greatest for ages 40–64 years (13.8) and 15–39 years (7.0) and for indigenous males (7.4). As socioeconomic status rose, non-indigenous admission rates fell (ASR = 1.7 to 1.1), yet indigenous admission rates rose (ASR = 7.9 to 14.0). Indigenous emergency to elective admission ratios were higher (I = 27 and NI = 8), as were readmissions (1.5–2 fold), self-discharge separations (I = 9.4% and NI = 1.4%), bed days (I/NI<sub>RR</sub> = 5.1), and admissions with an additional diagnosis (I/NI<sub>RR</sub> = 3.3) or procedure (I/NI<sub>RR</sub> = 3.4). Indigenous Australians maintained disproportionately high rates of emergency seizure hospitalization; from 1998 to 2004, the combined jurisdiction rate was more than five times the mean non-indigenous rate. Indigenous males aged 15–64 years were overrepresented. Indigenous patients had lengthier admissions but higher self-discharge and readmission rates. The socioeconomic data raise the concern that social disadvantage restricts access to hospital-based seizure care for indigenous patients.

© 2013 Elsevier Inc. All rights reserved.

### 1. Introduction

Despite Australia's economic wealth, indigenous Australians (Aboriginals and Torres Strait Islanders) experience significant health inequalities relative to the non-indigenous population [1,2]. Indigenous Australians have been reported to suffer the highest mortality and morbidity rates of any ethnic minority in the developed world [3]. The disproportionately high rates of cardiovascular disease [4,5], diabetes [6], alcoholism [7], and psychiatric illness [8] affecting Australia's indigenous communities are well known, but nationwide data on seizure rates based on indigenous ethnicity are unknown. Hospital emergency presentation and inpatient care are markers of seizure severity and seizure control in epilepsy [9]. Hospital care is often crisis care for seizure sufferers. Is seizure hospitalization another marker of the gap in health outcome that exists between indigenous and non-indigenous Australians? Other countries have looked at this

question. A North American study [10] showed that African Americans and Hispanics had three times the rate of emergency room visits and five times the rate of hospitalization for seizures compared with Caucasian Americans. A Canadian study [11] revealed that Aboriginal patients with epilepsy were more likely than non-Aboriginal patients to present to an emergency department or to be hospitalized with seizures. We hypothesized that similar observations apply in Australia.

### 2. Material and methods

The study design was observational, retrospective, and comparative. We examined Australian hospital admission data on seizure presentation by ethnicity – indigenous versus non-indigenous. Indigenous ethnicity was based on 'self-identification' of Aboriginal or Torres Strait Islander status. Data across six years (July 1st 1998 to June 30th 2004) were sourced from the National Hospital Morbidity Database (NHMB) of the Australian Institute of Health and Welfare (AIHW) using the International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) [12] codes: G40 (epilepsy), G41 (status epilepticus), R56.0 (febrile convulsion), and R56.8 (fit, convulsion, and seizure not otherwise specified). Australian Institute of Health and Welfare auditing

\* Corresponding author at: Centre for Neurosciences and Neurological Research, Level 5 Daly Wing, St Vincent's Hospital, 35 Victoria Parade, Fitzroy, Victoria 3065, Australia. Fax: +61 392883350.

E-mail address: [chris.plummer@svhm.org.au](mailto:chris.plummer@svhm.org.au) (C. Plummer).

revealed that indigenous hospital admission data were compromised up to 2005 by inadequate documentation of indigenous status in patient records for New South Wales, the Australian Capital Territory, Victoria, and Tasmania [13] but not for the Northern Territory (NT), Queensland (Qld), South Australia (SA), and Western Australia (WA). The latter jurisdictions were, therefore, included in the study (in cases where indigenous status was unmarked in the hospital record, the default status was “non-indigenous”). For each jurisdiction, the total number of hospital admissions per year was determined and converted to an age-standardized rate (ASR) per 1000 population per year by the direct method [14] based on 2001 Australian population census data. Age standardization was necessary because Australia’s minority indigenous population has a younger age structure than its non-indigenous population [14]. The 2001 census indicated that the indigenous population comprised 2.4% of the national population and 3.5% of the combined populations of NT, Qld, SA, and WA (Appendix Table 1) [15]. Indigenous (I) and non-indigenous (NI) ASR results for seizure hospitalization were expressed as I/NI ratios ( $I/NI_{RR}$ ) for which 95% confidence intervals (CIs) were calculated. Non-indigenous and indigenous seizure admission data were also compared by age at admission, gender, admission mode, admission frequency (distinguishing one-off from repeat patient admissions), urgency of admission, additional diagnosis, admission with a procedure, length of stay, separation mode (discharge status), and socioeconomic status (SES). Socioeconomic status was based on the SEIFA (socioeconomic index for area) score as developed by the Australian Bureau of Statistics (ABS) [15] – the SEIFA is an averaged scale of relative social advantage based on census variables (such as education and employment) unique to a local area population [12]. Socioeconomic status data were ranked from lowest to highest as 1 – most disadvantaged, 2 – second most disadvantaged, 3 – middle quintile, 4 – second most advantaged, and 5 – most advantaged. Ethics approval from St Vincent’s Hospital Melbourne involved consultation with national indigenous representatives and with data custodians from each jurisdiction.

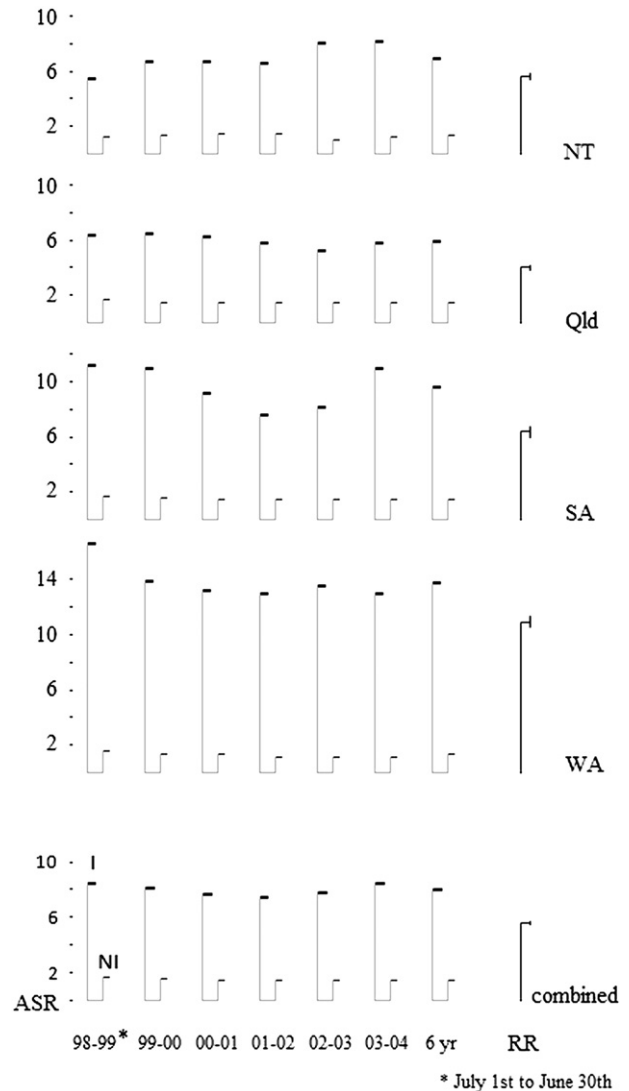
### 3. Results

#### 3.1. Total admissions and age-standardized seizure admissions (Fig. 1, Appendix Table 2)

From July 1st 1998 to June 30th 2004, combined (four jurisdictions over six years) total hospital admissions with a seizure diagnosis were 71,185–11,593 (16%) for indigenous (I) and 59,592 (84%) for non-indigenous (NI). Contributions from each jurisdiction were as follows: Northern Territory (NT) – 5 hospitals (I = 2090 and NI = 990), Queensland (Qld) – 170 hospitals (I = 3977 and NI = 31,691), South Australia (SA) – 80 hospitals (I = 1305 and NI = 13,154), and Western Australia (WA) – 95 hospitals (I = 4221 and NI = 13,757). Age-standardized rates (ASR) per 1000 population were higher in the indigenous population for every jurisdiction and year (means = 3.5 to 12.3 times greater). Cumulative six-year I/NI ASR ratios ( $I/NI_{RR}$ ) were as follows: NT = 5.6 (95% CI = 5.4–5.9), Qld = 4.0 (95% CI = 3.9–4.2), SA = 6.4 (95% CI = 6.0–6.8), and WA = 10.9 (95% CI = 10.6–11.4). The differences held from year to year. Annual  $I/NI_{RR}$  ranges were as follows: NT = 4.7–8.1 (95% CI = 3.8–9.9), Qld = 3.5–4.2 (95% CI = 3.2–4.6), SA = 5.5–7.3 (95% CI = 4.7–8.4), and WA = 10.2–12.3 (95% CI = 9.3–13.4).

#### 3.2. Age at admission (Fig. 2, Appendix Table 3)

Indigenous patients aged 40 to 64 years accounted for most of the interethnic disparity in the seizure hospitalization rate. For this cohort, the cumulative six-year  $I/NI_{RR}$  for combined jurisdictions was 13.8 (13.3–14.3), which was double that of the 15–39 year age group (7.0, 95% CI = 6.8–7.2), triple that of the 65+ year age group (4.1, 95% CI = 3.6–4.5), and ten times that of the 0–14 year age group (1.4, 95% CI = 1.4–1.5). These orders of difference between age cohorts held



**Fig. 1.** Admissions by jurisdiction (1998–2004). Abbreviations: I (indigenous), NI (non-indigenous), ASR (age-standardized rate), RR (rate ratio), NT (Northern Territory), Qld (Queensland), SA (South Australia), WA (Western Australia), yr (years).

from year to year; annual  $I/NI_{RR}$  ranges (combined jurisdictions) were as follows: ages 0–14 years = 1.2–1.8 (95% CI = 1.1–1.9), 15–39 years = 6.1–7.6 (95% CI = 5.6–8.2), 40–64 years = 11.5–15.0 (95% CI = 10.5–16.4), and 65+ years = 3.1–6.3 (95% CI = 2.3–8.0).

#### 3.3. Gender (Fig. 3, Appendix Table 4)

The seizure hospitalization rates for indigenous males were disproportionately high for every year of the study period. The six-year cumulative  $I/NI_{RR}$  for indigenous males was 2.2 times the rate of indigenous females (95% CI = 2.1–2.3) and 7.4 times the rate of non-indigenous males (95% CI = 7.3–7.6). The rate of indigenous female admissions was fourfold the rate of non-indigenous female admissions on a proportionate population basis (six-year female  $I/NI_{RR}$  = 4.2, 95% CI = 4.0–4.3).

#### 3.4. Socioeconomic status (Fig. 4, Appendix Table 5)

For the four jurisdictions combined, non-indigenous admission rates were highest amongst those with the lowest socioeconomic status (rank 1 ASR = 1.7) and lowest for those with the highest SES (rank 5 ASR = 1.1) from July 1st 2001 to June 30th 2004 (1998–2000 data

Download English Version:

<https://daneshyari.com/en/article/6012608>

Download Persian Version:

<https://daneshyari.com/article/6012608>

[Daneshyari.com](https://daneshyari.com)