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Barwon Health

DEAKIN UNIVERSITY

Variations in Guillain Barre Syndrome Incidence and Severity in Australia

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INTRODUCTION

Guillain Barre Syndrome (GBS) is an autoimmune peripheral nervous system condition with a worldwide incidence of 1-2 cases/100,000 people/ year.[1] Clinical course varies significantly with some patients minimally affected while others progress from independently mobile to requiring mechanical ventilation in 24 hours. The singular published Australian reference is a 1987 Western Australian audit with an incidence rate of 1.35 cases/100,000/year.[2] Rates of mechanical ventilation in Australia range from 0% to 28%.[2,3]

However, Barwon Health clinicians have noted consistent admissions for patients with GBS requiring mechanical ventilation, often for lengthy periods. Rehabilitation can be a protracted process with input required from multiple medical specialties, nursing and allied health staff to achieve discharge home. Globally, a fifth of patients have persistent symptoms, and many continue to struggle with pain and fatigue despite an improvement in function.[4]

OBJECTIVES

1. Establish the incidence and severity of GBS in the Barwon South West Region (BSWR).
2. Compare the incidence and severity to the neighbouring Grampians Region (GR) and the published Australian data.

METHODS

A retrospective file audit was completed for patients living in the BSWR or GR admitted to any hospital with GBS from 2009-2019. Local primary investigators were recruited to audit at Southwest Health Care (RM), Ballarat Health Services (SW), and Wimmera Health (CP) along with Barwon Health (PP and BC). Where the diagnosis was not certain a Neurologist would make the final decision on inclusion (SKC).

Statistical analysis was completed using Stata (OK, SG). The chi-squared test was used to compare frequencies. Victorian population data was sourced from the Australian Bureau of Statistics enabling calculation of age adjusted rate of GBS.

Table 1: Patient demographics

Characteristic	Total	Barwon South West	Grampians	p-value
	N=120	N=91	N=29	
Age, median (P^{25},P^{75})	58 (38-72)	55 (36-70)	64 (49-74)	0.23
Gender, n(%)				
Male	67 (55.8)	52 (57.1)	15 (51.7)	0.61
Female	53 (44.2)	39 (42.9)	14 (48.3)	
Preceding illness, n (%)				
URTI	22 (17.7)	19 (20.2)	3 (10.0)	0.20
Gastro-intestinal	31 (25.0)	26 (27.7)	5 (16.7)	0.22
Other	28 (22.6)	20 (21.3)	8 (26.7)	0.59
NIL	43 (34.7)	29 (30.9)	14 (46.7)	0.11
Season of onset, n (%)				
Winter	27 (22.5)	22 (24.2)	5 (17.2)	0.74
Spring	31 (25.8)	22 (24.2)	9 (31.0)	
Summer	25 (20.8)	20 (22.0)	5 (17.2)	
Autumn	37 (30.8)	27 (29.7)	10 (34.5)	

RESULTS

There were no statistically significant differences in patient demographics (Table 1). Table 2 shows the statistically significant difference in incidence of GBS between the BSWR and GR (p = 0).

Table 2: Incidence of GBS in BSWR and GR

Region	Number of cases	Incidence/100,000/ year	95% Confidence Intervals
Barwon South West	91	3.0	2.4-3.7
Grampians	29	0.9	0.6-1.3

Compared with living in the GR, people in the BSWR are 3.26 times more likely to be admitted to hospital with GBS (95% CI 2.14-4.95, p < 0.001).

Intensive Care Unit (ICU) admission occurred in 27.5% of BSWR patients and 24.1% of GR patients (P = 0.81), with mechanical ventilation required for 17.6% of BSWR patients and 10.3% of GR patients (p = 0.56). Hours of ventilation, length of ICU stay and acute hospital length of stay were not significantly different. Phenotype of GBS was also similar between groups (p = 0.16).

GBS disability scores at nadir were similar (p = 0.74), and were not significantly different six months after admission either (p = 0.07). Additionally, of the clients sufficiently affected to be bed bound at nadir there was no difference in average level of disability at 6 months (p = 0.21). Discharge destinations were also similar with 46 (50.5%) BSWR patients and 18 (62.1%) GR patients being admitted to rehabilitation units.

DISCUSSION

Our data showed a significant increase in the incidence of GBS in the BSWR without any increase in the severity of disability, illness or length of stay. Not only was the BSWR incidence much higher than the GR, it was also significantly higher than published Australian[2] and international literature.[1]

Rates of admission to ICU and mechanical ventilation were similar between the regions and both were lower than the figures found in Western Australia and the Eastern Coast of Australia.[2,5] However, they were much higher than another study in central Sydney.[3]

We expected to see a slower rate of recovery in the BSWR for those more severely affected but this was not the case. We did not find any difference in preceding illness that may explain the increased incidence in the BSWR.

CONCLUSION

People living in the BSWR are at greater likelihood of contracting GBS compared with those living in the GR and the rest of Australia. Health services in the BSWR need to ensure they are prepared to regularly manage patients with severe neuromuscular weakness. Further research is required to identify the drivers for the increased incidence and to identify methods for reducing the disability associated with GBS.

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