

Burden of disease due to Guillain-Barré syndrome in Colombia, 2014-2018.

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Resumen

This article aims to estimate the prevalence of GBS in the Colombian population, calculate the mortality rates associated with GBS, and evaluate trends over time by Dalys of GBS in Colombia from 2014-to 2018, stratifying by age and sex to contribute to feeding information regarding this pathology.

For the calculations made in Microsoft Excel 2016, a pre-established Unisalud source template uses; where both disability-adjusted life years (DALYS) and years of life with Disability (YLD) and years of life lost due to premature death (YLLP) formulates.

It was for four years (2010-2014) for all the departments of Colombia by age group. The specific mortality by ICD-10 code: G610 and the population by simple ages uses; These data extracts from the DANE of demography and population and the disability weight for GBS from the Institute for Health Metrics and Evaluation (IHME) page in the Global Burden of Disease (GBD) file.

Morbidity due to GBS obtained by consulting attended by primary diagnosis G610 captured in the years 2014 - 2018 by age determined age group (five-year period) and by sex to finally add the number of people attended diagnosed with GBS deaths in each age group.

The present study met the initially proposed objectives; a prevalence for GBS of 3.7 per 100,000 inhabitants was estimated in the years 2014-2018 in the Colombian population, mortality associated with a total GBS of 54.4 in 100,000 inhabitants, and

the Dalys trend of 0.5 per 1,000 inhabitants with GBS in the years 2014-2018, stratifying by age and sex in Colombia.

Introduction

Guillain-Barré syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy (AIDP). It was first recognized more than a century ago and is the most common form of GBS. Guillain-Barre syndrome is an immune disease by T cells directed against peptides of myelin proteins P0, P2, and PMP22 of the peripheral nerve with secondary axon loss. In addition, it produces progressive ascending weakness, accompanied by mild sensory loss and decreased reflex response (hyporeflexia or areflexia), which evolves up to a minimum of four weeks (1).

It is a relatively rare acute peripheral neuropathy. It is considered of uncertain origin and is not hereditary; the evolution is rapid and progressive, with somatic motor and sensory disorders and dysautonomic manifestations (2)

, progressive weakness manifesting as numbness, paresthesias, "numbness" in the fingers and toes, and sometimes lower back pain, and loss of muscle function. It begins ascending in the lower limbs and advances proximally in the upper limbs, which sometimes evolves into ventilatory failure.

In the clinical of Landry's palsy, cranial nerve damage occurs in 25% of cases, the characteristic of bilateral facial paresis; in some cases, approximately 15%, dysfunction occurs in sphincters, and there may also be a weakness in the muscles of swallowing, phonation and chewing (3).

This disease occurs in three phases, called progression, stabilization, and regression, usually completed in 3 to 6 months.

The progression phase of the neurological disorder is the stage between the beginning of the clinical manifestations and the presentation of symptoms of greater intensity; the evolution is approximately four weeks.

The stabilization phase is between the end of progression and the beginning of clinical recovery. It lasts an average of 10 days. This stage may be absent or very brief.

The recovery/regression phase is between the beginning of the recovery and its end. After that, neurological defects that persist can be considered sequelae. This last stage lasts approximately one month, but this time varies from one individual to another, depending on the severity and extent of the neurological damage (4).

According to the Ministry of Health's definition, an orphan disease is chronically debilitating and severe, threatens life, affects the prevalence of approximately 1 per 5,000 people, and regulates in Laws 1392 of 2010 and 1438 of 2011.

Worldwide, GBS, according to the World Health Organization (WHO), has low incidence rates: approximately it ranges between 0.4 and 4 cases per 100,000 inhabitants per year. It affects all people in North America and Europe, more men than women regardless of age, but its incidence increases from 50 to 70 years. The onset of this disease ranges between 40 years; according to the literature, it affects men more significantly than women. It is not rooted in a specific race or any nationality.

The incidence of GBS is estimated to vary between 0.20-3.23 cases per 100,000 inhabitants worldwide (5). The average age at which GBS presents is between 20 and 25 years (2). According to studies carried out in Nicaragua, an analysis of the years of life potentially lost (PYLL) in the period 2005-2012 shows that premature mortality increases in the age group of 20 to 39 years, with a decrease after 40 years.

According to a study at the San Vicente de Paul hospital in Colombia, 3.0 per 100,000 inhabitants have an annual incidence. GBS is one of the 2,149 orphan diseases described in Orphanet for Colombia in 2015 (6).

GBS is the orphan disease representing the highest proportion of rare diseases in the country. In Colombia, of the cases reported as acute flaccid paralysis in children under 15 years of age, 29% correspond to GBS. In children, the evolution is more favorable than in adults, with faster recovery and less risk of Disability (4).

GBS is of great importance in public health in Colombia because it is considered one of the diseases with the highest cost of health care due to different conditions that this pathology generates, such as Disability, work absenteeism, decreased income, and psychosocial impact. For both the patient and the caregiver.

It is transcendental that once the diagnosis is clinically suspected, the patient should hospitalize for medical surveillance, supportive care, recognition, and intervention of the complications that put the patient's life at risk.

This syndrome has a high impact on a psychological, social, and economic level due to the Disability it causes progressively. It is of rapid evolution and potentially lethal, so early diagnosis is vital to take necessary measures and preserve the lives of those who suffer from it. Additional, its differential diagnosis is not easy; it is confused with various neurological conditions.

This article aims to estimate the prevalence of GBS in the Colombian population, calculate the mortality rates associated with GBS, and evaluate trends over time by Dalys of GBS in Colombia from 2014-to 2018, stratifying by age and sex to contribute to feeding information regarding this pathology.

Materials and Methods

For the estimation of the burden of disease, the information by sex and age takes from the death report of the vital statistics of the National Administrative Department of Statistics (DANE), in which the primary diagnosis cause of death code ICD-10 G610; this corresponds to a syndrome of Guillain Barre (SGB), departments took the information

Health). To calculate the incidence rate, both people treated and those who died due to GBS CIE-10 (G610) takes into account. The source used was the cubes of the Integrated Information System of Social Protection SISPRO - RIPS (Individual Registry of Provision of Social Security Services).

The weight of Disability obtains from the Institute for Health Metrics and Assessment (Global Burden of Disease)from 2014 to 2018.

The Disability was obtained, and this duration by the weight of the specific Disability for the disease. It was obtained to calculate years of life lost due to premature death (subtracting the life expectancy according to the life table with the age of death).

For the calculations made in Microsoft Excel 2016, a pre-established Unisalud source template uses; where both disability-adjusted life years (DALYS) and years of life with Disability (YLD) and years of life lost due to premature death (YLLP) formulates.

It was for four years (2010-2014) for all the departments of Colombia by age group. The specific mortality by ICD-10 code: G610 and the population by simple ages uses; These data extracts from the DANE of demography and population and the disability weight for GBS from the Institute for Health Metrics and Evaluation (IHME) page in the Global Burden of Disease (GBD) file.

Morbidity due to GBS obtained by consulting attended by primary diagnosis G610 captured in the years 2014 - 2018 by age determined age group (five-year period) and by sex to finally add the number of people attended diagnosed with GBS deaths in each age group.

Results

Prevalence of GBS in Colombia for the years 2014-2018

Of 9,203 people treated for this cause, the estimated prevalence was 3.7 per 100,000 inhabitants.

Rate, percentage, and many people who died by age group and sex in Guillain Barre Syndrome for Colombia from 2014-2018.

Colombia's global GBS mortality rate was 54.4/100,000 inhabitants from 2014 to 2018, being higher in men (37 / 100,000 inhabitants) than in women (17.4 / 100,000 inhabitants). (Table 1)

Table 1.

Tasas de defunciones por grupo de edad y sexo.				
grp_edad2	hombre	mujeres	Total general	porcentaje (%)
0-4	0,2	0,1	0,2	0
5-14	0,1	0,0	0,1	0
15-29	0,5	0,3	0,7	1
30-44	1,5	0,9	2,4	4
45-59	8,3	4,0	12,3	23
60-69	9,6	6,1	15,6	29
70-79	6,3	3,3	9,5	17
80+	10,6	2,9	13,5	25
Total general	37,0	17,4	54,4	100

A total of 361 deaths, 63% in men and 37% in women; most of the deaths occurred in the group of 45-59 years with 137 deaths (38%), followed by the group of 60-69 years with 89 deaths (25%), and in third place the group of people over 80 years with 43 deaths (12%) (Table 2).

Table 2.

Número de defunciones por grupo de edad y sexo.				
grp_edad2	hombre	mujeres	Total general	porcentaje (%)
0-4	3	1	4	1
5-14	3	0	3	1
15-29	10	5	15	4
30-44	23	15	38	11
45-59	90	47	137	38
60-69	50	39	89	25
70-79	19	13	32	9
80+	31	12	43	12
Total general	229	132	361	100

Minor differences by gender are observed, with the number of deaths being higher in the 45-59 age group in both men (39%) and women (36%). In women, the percentage of deaths is slightly higher in the group of 60-69 years (30%) (Table 3).

Table 3.

Proporcion de defunciones por grupo de edad y sexo.		
grp_edad2	mujeres (%)	hombres(%)
0-4	1	1
5-14	0	1
15-29	4	4
30-44	11	10
45-59	36	39
60-69	30	22
70-79	10	8
80+	9	14
Total general	100	100

Below is a graph of GBS mortality by sex and departments of Colombia during the years 2014-2018. The rates express in values per 100,000 inhabitants. The first 10 departments with the highest death rate were San Andrés and Providencia, Atlántico, Cesar, Bolívar, Amazonas, Huila, Sucre, Tolima, Nariño and Quindío. In all departments, the most affected population was men.

Table 4. GBS mortality rate, years 2014-2018 in Colombia.

Departamento	TBM (100 000 hab)		Total Suma de TBM	Número total de fallecidos
	hombre	mujeres		
San Andres Y Providencia	10,4	0,0	5,2	2
Atlantico	3,9	3,0	3,5	43
Cesar	3,5	1,9	2,7	14
Bolivar	3,4	1,9	2,6	28
Amazonas	5,2	0,0	2,6	1
Huila	4,4	0,3	2,4	14
Sucre	1,8	2,4	2,1	9
Tolima	1,7	2,3	2,0	14
Nariño	2,9	0,7	1,8	16
Quindio	2,9	0,7	1,8	5

Disease burden






















Disease burden by age and sex for GBS in 2018, Colombia.

In Colombia, a total disease burden of 0.4 DALYS was estimated. This analysis is done for every thousand people of the total disease burden and corresponds to 54% DALYS of Disability and the remaining 46% to DALYS of mortality.

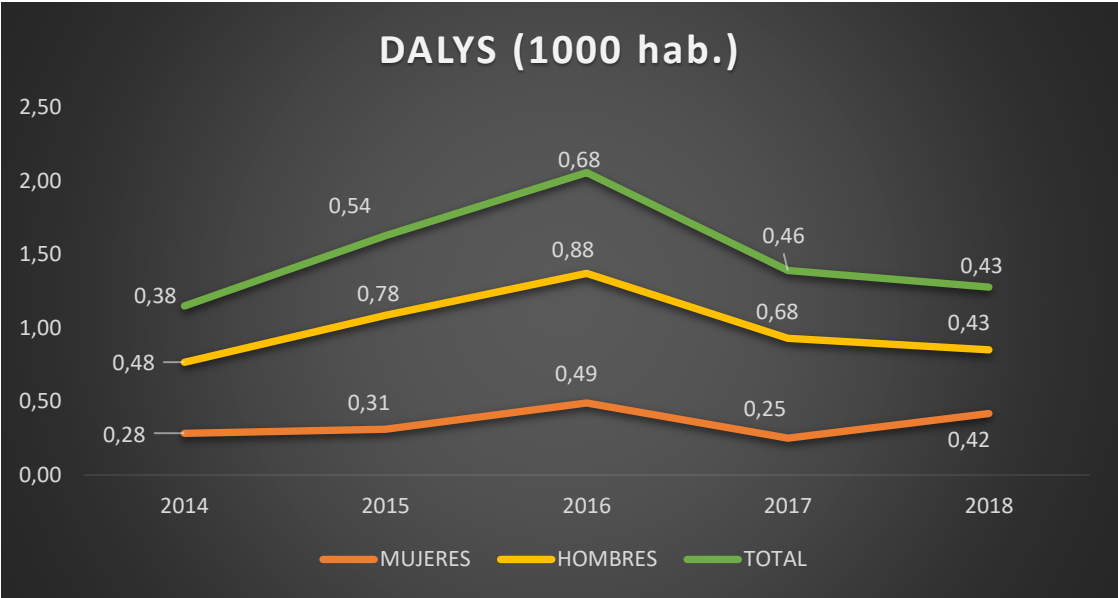
When analyzed by sex, there is no difference between women and men; they have the same amount of DALYS, while the percentage of mortality DALYS is slightly higher in men (26%) than in women (17%).

Within the age group with the highest burden of disease, the group of 70-79 years is observed in women with 1.1 DALYS per 1,000 inhabitants, while in men, the highest burden of disease in the group of 60-69 years with 2.5 DALYS per 1000 inhabitants (Table 5).

Table 5. The burden of disease by age and sex for GBS in 2018, Colombia.

Edad	Mujeres	Hombres	Total
	DALYs por 1000	DALYs por 1000	DALYs por 1000
0-4	 0,5	0,0	 0,2
5-14	0,0	0,0	0,0
15-29	 0,1	0,0	 0,1
30-44	 0,8	0,0	 0,4
45-59	 0,3	 1,2	 0,8
60-69	 0,9	 2,6	 1,7
70-79	 1,1	 2,1	 1,6
80+	 0,1	 0,8	 0,4
Total	 0,4	 0,4	 0,4

Graph 1. The trend line for GBS disease burden by sex in 2014-2018, Colombia.



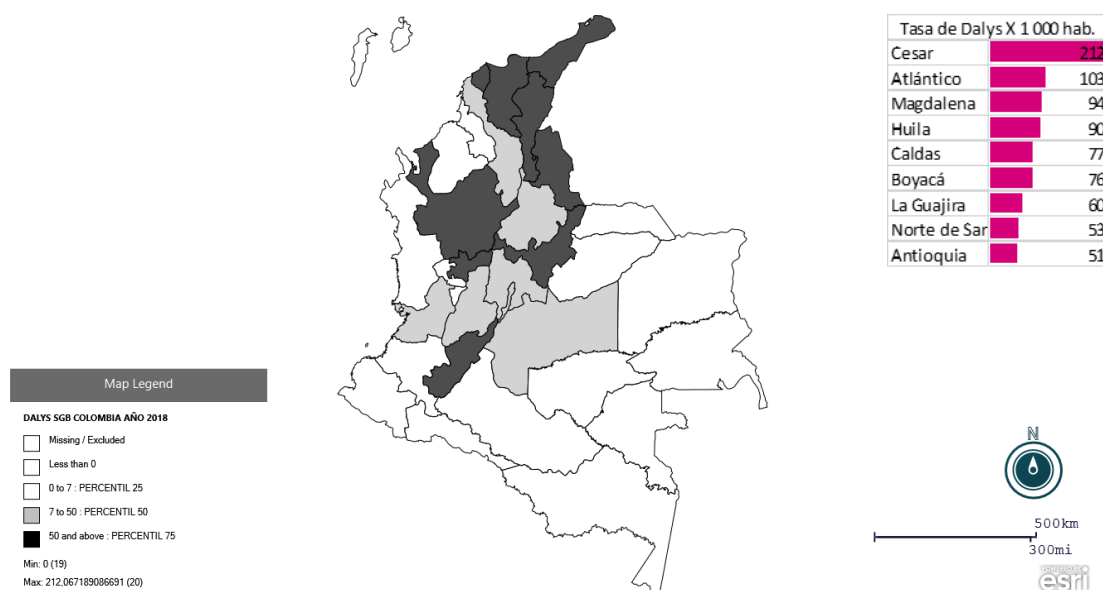
Source: DANE, the underlying cause of death ICD-10 (G610), 2014-2018.

	DALYS (1000 hab.)		
	FEMALES	MALES	TOTAL
2014	0,28	0,48	0,38
2015	0,31	0,78	0,54
2016	0,49	0,88	0,68
2017	0,25	0,68	0,46
2018	0,42	0,43	0,43

Comparing the years under study, we can deduce that in 2016 the highest burden of disease for GBS occurred, with men being the most affected by this disease; followed by the year 2015, observing a difference of 0.14 for the immediately subsequent year, with men being the most affected sex in the same way. We infer this for all the years except 2018. DALYS is the same for both sexes (Figure 1).

The Zika outbreak presented in Latin America in 2014 showed that it was related to a higher occurrence of GBS in Colombia. After analyzing 68 patients with the identical pathology in six hospitals in Colombia, the results showed that, from October 2015 to March 2016, there were 2,603 laboratory confirmed Zika infections and 401 patients with a neurological syndrome that had a history of Zika infection; 270 of the cases (67%) corresponded to GBS (8).

Map 1. Dalys by departments for GBS in Colombia in 2018.



Source: own creation calculations with Dane population; the year 2018.

Map 1 shows the departments that presented the highest rate of disability-adjusted life years for GBS, marked in dark gray. Highlighted in light gray are the departments with the lowest rate of disability-adjusted life years and those with little or no DALYs in white.

Discussion

The results of the GBS burden of disease study for Colombia 2014-2018 are consistent with related studies in the literature.

In the system surveillance in 2016, 687 cases, and 2017, 2,164, improving the reporting of cases, thus allowing surveillance of this event (7).

According to the National Institute of Health (INS), in 2017, 90 cases of neurological syndromes (GBS, ascending polyneuropathies, among other similar neurological conditions) with a history of febrile illness compatible with Zika virus infection were reported, of which 48.9 % (44) are female. These cases report with the ICD-10 code for Guillain Barré Syndrome (G-610) (9). The highest proportion of cases concentrates in 10 to 24 years and 30 to 44 years, with 34.4% (31) and 30.0% (27), respectively.

The present study met the initially proposed objectives; a prevalence for GBS of 3.7 per 100,000 inhabitants was estimated in the years 2014-2018 in the Colombian population, mortality associated with a total GBS of 54.4 in 100,000 inhabitants, and the Dalys trend of 0.5 per 1,000 inhabitants with GBS in the years 2014-2018, stratifying by age and sex in Colombia.

According to the Global Burden of Disease (GBD), HLY rates for neuromotor diseases in South American countries such as Argentina (19.2 X 100,000 inhabitants), Chile (26.3 X 100,000 inhabitants), and Uruguay (14.1 X 100,000 inhabitants) have a higher average HLY rate in both sexes in all age groups compared to Colombia (12.7 X 100,000 inhabitants).

Because the cases presented for this cause are very few, the variability in the stages of this disease and its difficult differential diagnosis make it challenging to precisely know the years of life expected for this syndrome

. In GBS-specific disease burden literature, very few studies use for comparison.

National integrated information systems of the country, although we cannot identify the number of cases left out of the registry due to inaccessibility of the population to the registration of the facts geographic, socioeconomic, or cultural. Also, due to the lack of articulation and inefficient functioning between the civil registry and the vital statistics system. The limitation of this study is the quality of the data from the information systems since the information required to estimate the burden of disease requires previously recorded records and attempts to trust the recorded information; this can be a weakness when making decisions on issues related to public health policies. We find the probable underreporting among the possible weaknesses because this pathology is difficult to diagnose. The primary diagnosis of death considers the trend of the disease with the data recorded only in the vital statistics bases.

To minimize bias, deaths, and diagnoses recorded by the cause under study were compared, relating it to different sources of information such as DANE, SISPRO, and associated literature.

This syndrome is a controllable autoimmune disease, and it is confused with various neurological conditions of rapid evolution. It is potentially lethal, so its early diagnosis

is vital for taking necessary measures and preventing its evolution to preserve the lives of those who suffer from it.

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