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Original

Descriptive epidemiological study of migraine in three emergency departments of the public health network of Chile

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Background
Migraine is a prevalent neurological disorder with a significant impact on public health. This study aims to describe the epidemiological profile of migraine cases treated in three public emergency departments in Chile.

Methods
A descriptive epidemiological study was conducted using data from patients diagnosed with migraine in three emergency departments. Patient demographics, clinical presentation, and treatment approaches were analyzed.

Results
During the study period, 199,263 patients were seen across three hospitals. Migraine consultations accounted for 1.47% of visits, with 1.65% at HLF, 1.2% at HFB, and 1.58% at HCM. The majority of cases were in women at HLF and HFB, while men represented 71.6% of cases at HCM. The highest frequency of cases was observed in the active age groups.

Conclusions
This study highlights the burden of migraine in public emergency departments in Chile. The findings emphasize the need for optimized treatment protocols and preventive strategies to improve patient outcomes.

Keywords:
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Introduction

Worldwide prevalence studies indicate that migraine is two to three times more common in women than in men between the ages of 30 and 39 (1–20). In Latin America, the prevalence of migraine has been reported to range from 1.6% (Mexico) to 20.1% (Venezuela) (2). There is limited data on the prevalence of migraine in emergency services in Hispanic America. In the Global Burden of Disease studies for the year 2016, migraine ranked second for years lost due to disability (3).

Migraine is generally divided into two groups based on headache days per month. Episodic migraine (EM) is characterized by <15 headache days per month and chronic migraine (CM) is characterized by 15 headache days per month (21–30). Compared with patients who have episodic migraine, individuals with chronic migraine have a substantially reduced health-related quality of life and their condition has a substantially greater effect on daily activities, direct medical costs, and prevalence of medical comorbidities. Chronic migraine is also associated with a greater use of health-care resources, including more frequent visits to primary-care physicians, specialists, and emergency departments than episodic migraine (27,29,30).

In Chile, a prevalence study conducted in the 1990s in individuals aged 15 and older in the urban area of Santiago found that the percentage of migraine among total headaches was 19.6%. The prevalence of migraine was 7.3% (11.9% in women and 2% in men), with a higher presence in the age group between 50-59 years, and migraine with aura at 3.5% (0.5% in men and 6.2% in women (4). Additionally, in the National Health Survey of Chile for the years 2016-2017, 8.6% of participants reported that a doctor had mentioned that they suffered from migraine or frequent headaches, ranking first in this question and surpassing conditions such as insomnia (5.6%) or asthma (5.4%) (5).

Regarding the distribution by sex and age of individuals consulting for migraine, a study in Argentina shows that out of a total of 1,294 neurological outpatient consultations, 81.2% were women, with an age range between 31 and 35 years. For men, although there were fewer consultations (18.2%), they occurred at an earlier age between 10 and 16 years (6).

Some mention has been made of seasonal variability in migraine. A retrospective review of 214 hospital admissions for migraine in South Carolina over a 20-year period revealed that the majority occurred during the spring (7).

As for costs, it is estimated, according to U.S. statistics, that the cost generated to the healthcare system by migraine users is 28 billion dollars per year (8,24). Migraine, and especially chronic migraine, has a high socioeconomic impact, especially when associated with headache due to analgesic overuse (17,22). In Chile, a study related to out-of-pocket expenses of migraine patients in 2018 surveyed 360 Chileans, the majority of whom were health insurance beneficiaries. 59.4% of patients sought emergency care with an average of 3.9 visits per year, and 15.6% required hospitalization for migraine in the last year (9).

The public health impact of migraine is often underestimated, possibly due to its episodic nature and the lack of mortality associated with the disorder. Despite this, migraine is a highly prevalent disease in the general population and is often debilitating, generating a significant impact on social and occupational activities. Additionally, it involves a notable consumption of medications and an increase in the use of medical services, thus having a significant impact on public health (10).

In contrast to many chronic diseases that manifest in advanced stages of life, migraine has an early onset, starting around the ages of 15-20 and decreasing after the age of 50. This pattern reveals a significant impact on productivity, as it affects the most active period of life, highlighting the considerable socioeconomic implications of this condition.

Most people with migraines indicated that their migraine attacks frequently interfere with work productivity and advancement, attending important events, and spending time with family and friends, resulting in the addition of more stress, which is a migraine trigger. These statistics highlight the stigma connected to and lack of awareness about migraines (18,28).

In a study conducted in France with 20,000 participants, significant impacts of migraine were found in the workplace and quality of life. Between 1989 and 1992, 54.8% of workers missed at least one day due to headaches. Additionally, people with migraine showed a reduction in working hours, lower productivity, and difficulties concentrating on tasks. The assessment of quality of life, using the SF36 questionnaire, revealed indicators below average compared to people without chronic diseases (12).

In the United States, the annual cost of productivity loss due to migraine is estimated between 1.2 and 17.2 billion dollars. Additionally, the direct costs associated with the use of health services are considerable. Over a year, there were 10 million outpatient visits for headache in the United States, not counting visits to emergency services. A significant amount of money was also allocated to prescribed or over-the-counter medications for headache (13).

In Sweden, 84% of migraineurs reported experiencing severe pain. Overall, there are few local studies on migraine due to the complexity of data collection. There are also few reports showing the frequency of cases in relation to the rest of the demand in emergency services (14).

Head pain is the fifth most common reason for emergency department (ED) visits. It is second only to focal weakness as the most common reason for neurological consultation in the ED (19,26). However, the above is controversial, given that in other studies when considering the high population prevalence of migraine, use of the emergency departament for management of migraine is relatively uncommon. Fewer than 10% of all Americans with migraine report a headache visit to an emergency departament or an urgent care within a 12-month period (23). Risk factors for an emergency departament visit for migraine are analogous to other chronic diseases: lower socioeconomic status, worse underlying disease, and psychiatric comorbidities (25).

The objective of the present study is to determine the number of individuals aged 15 and older who consulted the Emergency Department of three hospitals in Chile during the year 2021 and were diagnosed with migraine.

Materials and Methods

Descriptive study based on a database analysis obtained from electronic records. Requests were made to the statistics departments of three hospitals in Chile for records with a hospital discharge diagnosis of Migraine, ICD-10 code G-43, and with an age equal to or greater than 15 years, registered between January 1st and December 31st, 2021.

The participating hospitals in this study are as follows: Hospital de la Florida, located in the municipality of La Florida, Santiago de Chile, of high complexity, with a reference population of 366,916; Hospital Félix Bulnes, of high complexity, with a reference population of 1,202,137 people, located in the municipality of Cerro Navia, Santiago de Chile; Hospital Clínico de Magallanes, in the city of Punta Arenas, with a reference population of 150,826; the latter is considered the southernmost High Complexity Hospital in the world.

The requested records include demographic data such as gender and age; the latter was regrouped in decades starting from 15 years old. The categories of the National Health Fund (FONASA) were also analyzed; FONASA is the public entity that administers funds for health in Chile, with the aim of identifying groups with greater socio-economic vulnerability (FONASA A and B) (Table 1).

Table 1 Sociodemographic characteristics of individuals aged 15 and over who consulted for migraine in 2021 at Hospital de La Florida (HLF), Hospital Félix Bulnes (HFB), and Hospital Clínico de Magallanes (HCM).

		Hospital 1 (HLF)		Hospital 2(HFB)		Hospital 3(HCM)	
		n	%	n	%	n	%
Sex	Men	585	34.8	204	25	360	71.6
	Women	1,096	65.2	604	75	911	28.4
Age group (years old)	15-24	248	16.61	144	17.82	237	18.64
	25-34	297	17.77	194	24.01	343	26.18
	34-44	275	16.38	152	18.81	254	19.98
	45-54	260	14.15	129	15.97	201	15.81
	55-64	226	12.32	86	10.64	124	9.75
	65-74	188	12.20	61	7.55	69	5.42
	75-84	143	8.48	33	4.08	34	2.67
	85-94	43	1.97	9	1.11	8	0.62
	≥95	1	0.12	0	0	1	0.07
FONASA Group	FONASA A	111	13.3	211	26.1	170	13.30
	FONASA B	431	53.0	291	36.0	537	42.2
	Others	271	33.3	306	37.80	564	44.3

Frequency tables were used to describe the demographic characteristics of the cases. The relative weight of the total Emergency Department admissions associated with Migraine in the studied population was calculated. The distribution for sociodemographic variables was evaluated, and the temporal trend during the study period was graphed. The data were analyzed using the statistical program Stata 17.

The data used in this study corresponds to systematic and routine records from the statistics departments of each hospital and do not include individualized information. This study has been approved by the ethics committee of Hospital Félix Bulnes, with study record number 16/2022 and protocol number 20-22.

Results

During the study period, a total of 199,263 patients were admitted through emergency services. In the Emergency Department of HLF, 52,142 patients were attended, of which 861 met the criteria for a Migraine discharge diagnosis. At HFB, a total of 66,755 were attended, with 808 meeting the inclusion criteria. In the Emergency Department of HCM, 80,366 patients were attended, and 1,271 met the inclusion criteria (see Table 2),mentioned in materials and methods.The percentage of Migraine consultations was 1.65% for HLF, 1.2% for HFB, and 1.58% for HCM during the year 2021, resulting in an overall percentage of 1.47%.

Table 2 Patients over 15 years old who consulted the emergency service for Hospital de La Florida (HLF), Hospital Felix Bulnes (HFB), and Hospital Clínico de Magallanes (HCM) due to headache/migraine in 2021

Hospital	Migraine		Other Pathologies		Total
	n	%	n	%	
HLF	861	1.7%	51,282	98,4%	52,142
HFB	808	1.2%	65,987	98,8%	66,795
HCM	1/271	1.6%	79,095	98,4%	80,366
TOTAL	2,949	1.5%	196,324	98,5%	199,263

Table 3 shows the monthly trend of Migraine cases throughout the year 2021. The characteristics of sex and age group are observed in Table 1 In HFB and HLF, the proportion of women is higher, while in HCM, men represent 71.6% of the cases. Regarding the distribution by age group, it is similar in the hospitals, being more frequent in the active age groups.

Table 3. Total headache/migraine consultations of the total SU consultations 2021 at Hospital de La Florida (HLF), Hospital Felix Bulnes (HFB), AND Hospital Clínico de Magallanes (HCM), distributed by month.

		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
HLF	Headache/ Migraine	78	62	97	61	63	55	75	89	69	90	71	51	861
	Other Pathologies	4.224	4.032	4.142	3.356	3.810	3.356	3.942	4.447	4.626	5.181	5.166	4.999	51281
	Total for 2021	**4302**	**4094**	**4239**	**3417**	**3873**	**3411**	**4017**	**4536**	**4695**	**5271**	**5237**	**5050**	**52142**
HFB	Headache/ Migraine	73	72	81	57	65	47	77	59	98	80	41	58	808
	Other Pathologies	5345	4581	4971	4339	4697	5570	5519	6097	6116	6541	6476	5735	65987
	Total for 2021	**5418**	**4653**	**5052**	**4396**	**4762**	**5617**	**5596**	**6156**	**6214**	**6621**	**6517**	**5793**	**66795**
HCM	Headache/ Migraine	77	64	79	97	92	64	124	121	138	203	146	140	1345
	Other Pathologies	6132	5562	6163	6537	5787	6044	6070	7453	7746	8438	8829	8265	83026
	Total for 2021	**6209**	**5626**	**6242**	**6634**	**5879**	**6108**	**6194**	**7574**	**7884**	**8641**	**8975**	**8405**	**84371**

Discussion

Studies based on population data of headache disorders are important. They inform needs assessment and support service policy for a set of disorders that are a public health priority (11). A recommendation to increase national evidence is to update the evidence on this issue by designing studies associated with measuring severity, frequency, location, duration, associated symptoms, and the impact on work and/or social activities of the most frequent headaches.

The results of our study indicate a percentage of migraine consultations of 1.65% at Hospital de la Florida (HLF), 1.2% at Hospital Félix Bulnes (HFB), and 1.58% at Hospital Clínico de Magallanes (HCM). Together, these figures yield an overall percentage of 1.47% of patients who consulted for migraine in the Emergency Department at the three hospitals during the year 2021.

Comparing these results with previous studies in Chile, it is observed that the number of consultations found in this study is relatively low compared to the data reported in earlier research. For example, the study from the 1990s in the urban area of Santiago showed a migraine prevalence of 7.3% (4), while the National Health Survey for the years 2016-2017 recorded 8.6% of participants mentioning being diagnosed with migraine or frequent headaches (5). These differences could be due to various factors, such as changes in data collection methodology or variations in the study population.

In terms of distribution by gender and age, the study reveals that the majority of migraine consultations correspond to women, representing 81.2% of cases, while men constitute the remaining 18.2%. This aligns with global studies indicating that migraine is more common in women than in men, especially between the ages of 30 and 39(1), except in HCM where the majority of consultations were from men (71.6% men vs. 28.4% women).This could partly be explained by the higher male population in the Magallanes region (2017 Census) (15). The result that in Magallanes it is more frequent in men than in women merits future research and there could be epigenetic factors that require future evaluations.

These findings highlight the importance of considering migraine as a disorder that affects different age and gender groups, which has implications for medical care and the planning of prevention and treatment strategies.

Overall, there is a shortage of local studies on migraine in Chile, which may be related to the complexity of data collection and the lack of detailed information on the frequency of cases in relation to other health demands. In this sense, this study contributes to the knowledge of the epidemiological description of migraine in three Chilean hospitals during the year 2021, providing relevant information for future research and the implementation of appropriate health policies.

Limitations of this study include that diagnoses in emergency department consultations were not entirely made by specialist doctors, and the methodology applied for diagnosis was very heterogeneous. There is a possibility that other causes of headache were mistakenly labeled as migraine. It is also worth noting that the year 2021 coincided with the Covid pandemic.

Strengths of the current study include that the diagnosis is strictly clinical, independent of neuroimaging or biological markers. More than 20 years had passed since prevalence studies of migraine were last published in our country. It is noteworthy that this study has a significant sample size (2,949 total migraine consultations) and was conducted in three major national reference centers, two in the Greater Santiago area (HFB and HLF), and the third (HCM) in the Magallanes region. Finally, the study has good record quality since the data is part of the official record managed by the Ministry of Health (MINSAL) (16).

Conclusion

Migraine is a relevant health disorder that affects a substantial part of the population, with variable prevalence in different countries and studies. In this study conducted in Chile, the results indicate that 1.47% of the total emergency consultations in the three hospitals analyzed during the year 2021 were registered as migraine (primary diagnosis). The higher percentage of migraine consultations was in women, and there was a presence of cases in men at an early age. Additionally, the economic burden associated with migraine is evident for both healthcare systems and patients.

We can conclude that there is an urgent need for epidemiological studies with standardized methodological strategies, in accordance with current ICHD criteria (V3). Future research, as well as the implementation of appropriate prevention and treatment strategies, are necessary to effectively address this health issue.

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