

Impact of the Stroke Law in Neuquén. First Experience in Argentina

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Abstract

This study examines the impact of Neuquén's pioneering Stroke Law in Argentina, focusing on its enactment and implementation. Neuquén, facing a high stroke incidence, established the first Argentinean legislation for stroke management, including prevention, acute treatment, and rehabilitation. The law led to the creation of the Provincial Stroke Network and inclusion of alteplase in the Neuquén Therapeutic Formulary. Results demonstrate advancements in healthcare delivery, with significant implications for public health policy and stroke management in Argentina. The study highlights challenges, particularly during the COVID-19 pandemic, and suggests future directions for comprehensive stroke care.

Keywords: Stroke, Stroke Management, Public Health Policy, Stroke Network

Introduction

The province of Neuquén, located in western Argentina in the Patagonia region, is renowned for its stunning geographic diversity, including mountains, forests, and rivers. It borders Mendoza to the north, La Pampa to the east, Rí'o Negro to the south, and Chile to the west. The capital, also named Neuquén, is a key urban and commercial center. Demographically, the province has experienced significant growth, partly due to the hydrocarbon industry in the Vaca Muerta formation, and has an approximate population of 650,000 inhabitants. The majority of the population lives in urban areas, and the ethnic composition mainly includes descendants of Europeans and indigenous communities such as the Mapuches. The economy greatly benefits from sectors such as oil, gas, tourism, and agriculture.

Stroke is the leading cause of disability worldwide and the second leading cause of death. The WHO estimates that 1 in 4 people will suffer a stroke in their lifetime (5). From 1990 to 2019, there has been a 70% increase in the incidence of stroke, a 43% increase in stroke deaths, a 102% increase in the prevalence of stroke, and a 143% increase in disability-adjusted life years (DALYs). The majority of the global stroke burden (86% of stroke deaths and 89% of DALYs) occurs in low- and lower-middle-income countries (2).

In 2020, Argentina recorded 17,728 deaths from cerebrovascular diseases, equivalent to a mortality rate of 39 per 10,000 (1). In 2010, it was estimated that a hospitalization for stroke in our country cost approximately US\$1,731 (6), and at that time, it was estimated that there were 101,005 DALYs in men and 91,777 DALYs in women in Argentina due to stroke (5).

A population-based epidemiological study conducted in a locality in Buenos Aires found a first-stroke incidence rate of 1,097 per 100,000 inhabitants and 317 per 100,000 inhabitants over 40 years of age (1). The 30-day mortality rate for first stroke events was 27% in that study while nationally, the fatality rate for cerebrovascular disease was estimated at 17.4% in men and 18.9% in women (8). Borrueal estimated that half of the male incidence and 37% of women with cerebrovascular disease had mild disability for 6 months, and the rest had permanent disability (2).

Despite the fact that stroke can largely be prevented, treated during the acute episode, and rehabilitated to reduce its sequelae, health systems show low adherence to current recommendations for effective implementation. Indeed, there is high-quality evidence of the favorable impact of various health interventions to prevent and treat stroke (5).

Various authors identify as the main barriers to effective and timely stroke treatment three main factors: lack of community information, absence of care protocols, and lack of coverage. In Argentina, in 2014, it was estimated that 1.2% of patients admitted to private centers had access to pharmacological thrombolysis, while in the ESTEPA II study (2023), 7.7% of stroke patients received thrombolytic therapy. This demonstrates that despite the solid scientific evidence supporting thrombolysis, the majority of patients in Argentina do not have access to thrombolytic treatment. (9)

In Argentina, there is no national legislation on stroke, although there have been legislative projects that did not prosper. Given the federal health organization, each province has autonomy to define its health policies. However, the Province of Neuquén was a pioneer, enacting the first stroke law in 2020 as part of a set of strategies that were part of a public policy for stroke treatment. In this context, our work aims to describe the context, process, and impact of the enactment and implementation of the first Stroke Law in Argentina in the Province of Neuquén.

Methodology

- To fulfill the purposes of the work, we propose the triangulation of qualitative and quantitative methods. Regarding the study, we conducted a descriptive retrospective investigation. To carry this out, we resorted to various sources of information that included epidemiological information, hospital production, medication management, and legislative information. These are detailed below:
- Epidemiological Information: Mortality and disease burden due to stroke.
- Hospital Production: Discharges due to cerebrovascular events, Registry of patients undergoing pharmacological and mechanical fibrinolysis in the public health subsector of Neuquén.
- Medication Management: Inclusion of Alteplase in the Neuquén Therapeutic Formulary, Purchases of Alteplase for the Public Health Subsector of Neuquén, Registry of patients in whom Alteplase was used.
- Legislative Information: Dates of entry of the stroke law project of Neuquén, dates of approval in each of the Committees of the Legislature, Date of Sanction and Regulation of the same.

Results

Regarding the case at hand, the vital statistics of the Province of Neuquén show that circulatory causes represent the second cause of mortality. Within this group, 34% of deaths are due to cerebrovascular diseases. Furthermore, data on the incidence of stroke or the prevalence of its sequelae in Neuquén were not identified. Regarding risk factors, the National Risk Factor Survey (NRFS) reports an increasing trend in the last 15 years in diabetes, obesity, sedentary lifestyle, and poor eating habits in Neuquén, with a decreasing trend in smoking and stability in the prevalence of arterial hypertension.

The recent creation of a Provincial Stroke Network in 2019 and the enactment of a Provincial Stroke Law in 2020 allowed for the systematization of data and analysis of health information. Indeed, the data provided by the Provincial Directorate of Statistics of the Undersecretary of Health of Neuquén allow observing the total number of hospital discharges due to stroke from the public health subsector of Neuquén.

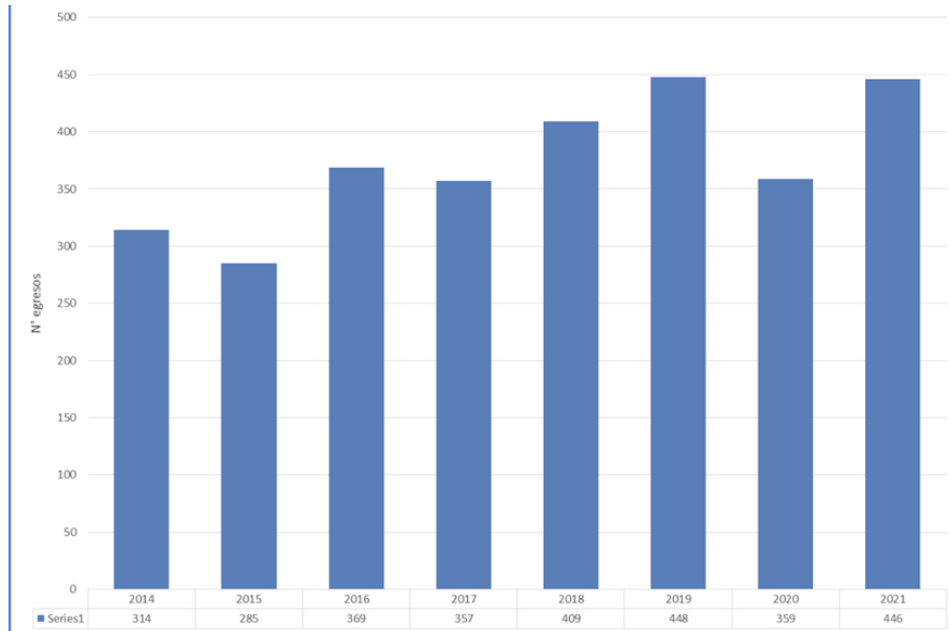


Fig. 1: “Discharges for total cerebrovascular events per year (ischemic and hemorrhagic). Period 2014-2021. Source: Statistics Neuquén.”

Public Policies for Stroke Treatment in Neuquén

In 2015, the tissue plasminogen activator (TPa) was incorporated into the Provincial Therapeutic Formulary and began to be used at the Provincial Hospital Neuquén. This public hospital of maximum complexity, located in the capital of Neuquén, develops its clinical practice guide and organizes the referrals of patients in therapeutic windows from the metropolitan area, the most densely populated. In 2019, the provincial stroke network was created, and sustained activities of training for health teams began, as well as awareness campaigns with the community. In 2020, the provincial stroke law was enacted, whose legislative process is detailed below. From 2021, the use of TPa began in four head hospitals in the interior of the province, and in 2022, the first mechanical thrombectomy was performed at the Provincial Hospital (fig 1). In October 2022, the Stroke Law was regulated, and the first coordinator of the Provincial Stroke Network was appointed in the Ministry of Health.

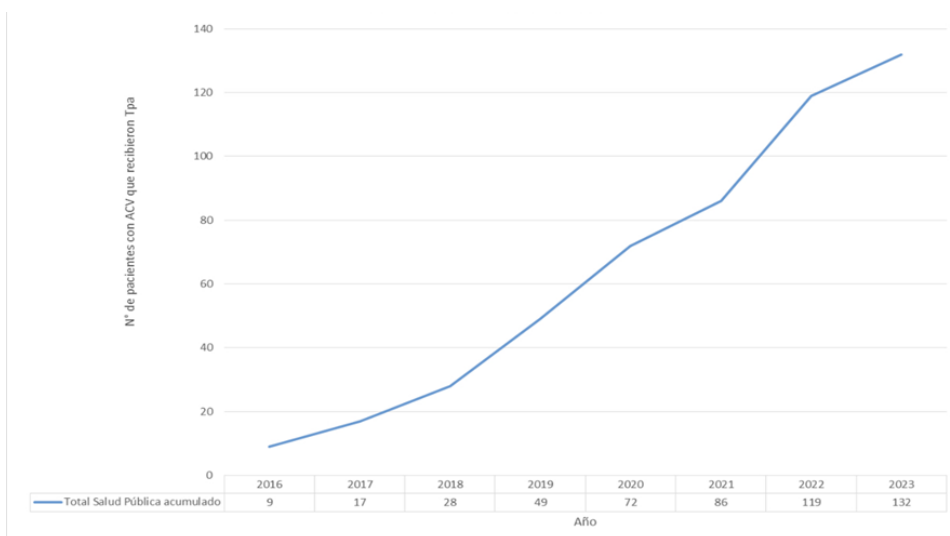


Fig 2. “Total number of patients who received fibrinolytics (Alteplase) in the public health system of Neuquén (cumulative). Period 2016-2023.

Source: Neuquén

Details of the Legislative Process

According to the Provincial Constitution, legislative projects like the stroke law must go through different stages for the parliamentary process. Indeed, the Stroke Law Project 3263 was presented by a multidisciplinary team that led this process, which included passage through various commissions. Thus, the Human and Social Development Commission advised the Provincial Chamber of Deputies to sanction the law project, whose purpose is to guarantee the population of the Province of Neuquén access to prevention, diagnosis, and treatment of stroke by creating a Provincial Stroke Network, also incorporating into the public health sector and the provincial social security (ISSN) the necessary coverage to provide such benefits, including endovenous and endovascular stroke treatment. The dispatch of Commission C was endorsed by the Commission of Constitutional Affairs and Justice and by the Commission of Finance and Budget. After the favorable dispatch of commissions, it was treated and approved in general and in particular. The passage of the law project through three legislative commissions refers to the quality of the norm that is sanctioned since the three commissions give a different legislative focus, whether from the constitutional, budgetary, or social point of view.

After this process, the law was promulgated by the Provincial Executive Power. The regulation stage was subsequent to this process, elaborated by the Ministry of Health, and approved by the Provincial Executive Power.

Upon reviewing the process, the intervening parties highlight the unanimous support that the project had from the various political parties within the Legislative Chamber, as well as in the Provincial Executive Power and within the Ministry of Health. Moreover, this complex challenge involved carrying out a set of actions parallelly on the community and within the health system. Activities of sensitization with the community and news in local journalistic media related to stroke and early treatment, trainings for health personnel, activities related to drug management, the development of guidelines and protocols in the different hospitals, the creation of a patient registry, and adaptations in the digital clinical history of the province of Neuquén were carried out.

It should be noted that the COVID-19 pandemic has had a significant impact on the detection and treatment of Strokes (Stroke) in Argentina, as in many other parts of the world. Some of the effects include:

1. Reduction in seeking medical care: During the pandemic, many people have avoided seeking medical care for fear of exposure to the virus, leading to a decrease in the early detection of strokes.
2. Limitations in health services: The overload of hospitals and the reallocation of resources to treat COVID-19 patients has led to a limitation in the capacity of health centers to provide emergency treatments to stroke patients.
3. Delay in treatment: The pandemic has caused delays in medical care and treatment procedures for stroke patients, which can negatively impact their long-term outcomes.
4. Changes in telemedicine: To overcome some of these challenges, the use of telemedicine in Argentina has increased, allowing for the remote assessment of stroke patients in some cases.

It is important to highlight that the responses and measures to address these challenges have evolved throughout the pandemic, and health authorities and medical professionals have worked to adapt to this situation(4). Timely attention and public awareness are key to mitigating the impact on the detection and treatment of strokes during the COVID-19 pandemic (7).

Training

As part of the strategy, training sessions were directed to health teams in various hospitals and health centers throughout the province. These sessions aimed to improve the early recognition of stroke symptoms, the timely management of acute stroke cases, and the understanding of the importance of rapid treatment. In addition, community awareness campaigns were launched to educate the public about the signs of stroke and the necessity of urgent medical attention. These campaigns utilized various media channels, including social networks, local newspapers, and radio stations.

Discussion

The enactment and implementation of the Stroke Law in Neuquén represent a significant advance in the management of stroke within the province and a model for public health policy in Argentina. This initiative has successfully integrated multiple elements of health care, from prevention and early detection to acute management and rehabilitation, demonstrating the importance of a comprehensive approach to stroke.

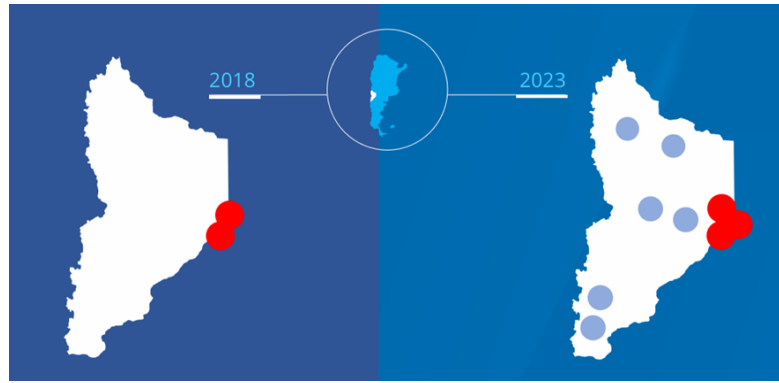


Fig 3. Evolution of stroke care centers before and after the enactment of the law. In light blue, development of primary stroke care centers (IV thrombolysis). In red, comprehensive stroke centers (IV thrombolysis, mechanical thrombectomy, stroke unit).

The establishment of the Provincial Stroke Network and the inclusion of alteplase in the Neuquén Therapeutic Formulary have been pivotal in enhancing the capacity of health services to provide timely and effective treatment for stroke patients. The training of health personnel and the public awareness campaigns have also played a critical role in improving early detection and treatment of stroke, ultimately contributing to better health outcomes for the population.

The public health system brought acute stroke treatment closer to remote populations, who due to geographic or climatic situations would not have had access to treatment within the therapeutic window of 4.5 hours for thrombolysis or longer for mechanical thrombectomy.

However, the journey is not without challenges. The COVID-19 pandemic has posed significant obstacles, impacting the delivery of health services and altering the public's health-seeking behavior. Despite these challenges, the commitment of the health authorities, the dedication of medical professionals, and the community's resilience have been instrumental in advancing the stroke care agenda in Neuquén.

Conclusion

The experience of Neuquén in enacting and implementing the first Stroke Law in Argentina offers valuable lessons for other provinces and countries seeking to improve stroke care. It underscores the importance of a coordinated approach that involves legislative support, health system strengthening, professional training, and community engagement. As we move forward, it is crucial to continue monitoring and evaluating the impact of these initiatives to ensure their sustainability and to identify opportunities for further improvement in stroke management and care.

Future Challenges

1. *Enhancing Early Detection:* Improving community awareness about stroke symptoms and the importance of immediate medical attention. This involves continuous public education and engagement to ensure that stroke is recognized and treated as a medical emergency.
2. *Expanding Access to Care:* Ensuring that remote and rural areas have adequate access to stroke care services, including rapid transportation to stroke-ready facilities and the availability of telemedicine for initial diagnosis and management.
3. *Integrating Advanced Technologies:* Incorporating advanced imaging and diagnostic technologies in hospitals to facilitate accurate and timely diagnosis of stroke types, which is crucial for appropriate treatment intervention.
4. *Training and Retention of Specialized Personnel:* Continuing the training of healthcare professionals in stroke care while also addressing challenges related to the retention of these skilled professionals, especially in less urbanized areas.
5. *Improving Rehabilitation Services:* Enhancing post-stroke care, including rehabilitation services, to ensure patients can recover to the best of their ability and regain independence, thereby reducing the long-term impact of stroke.

6. *Research and Data Collection*: Investing in research to better understand the local patterns and risk factors associated with stroke. Establishing a comprehensive stroke registry to track outcomes and improve stroke care services based on data-driven insights.
7. *Addressing Health Disparities*: Identifying and addressing disparities in stroke care among different population groups, ensuring that everyone has equal access to prevention, treatment, and rehabilitation services.
8. *Adapting to New Challenges*: Remaining adaptable to new challenges such as those presented by the COVID-19 pandemic, which has affected how healthcare is delivered and has added complexity to treating patients with stroke.
9. *Securing Funding and Resources*: Ensuring continuous funding and resources for the stroke care program, including medications, equipment, and personnel, especially in the face of economic constraints.
10. *Legislative Support and Policy Making*: Continuing to advocate for supportive policies and legislation that prioritize stroke care and allocate necessary resources for its prevention, treatment, and management.

Conflict of Interest

The authors declare that they have no conflict of interest.

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