▪ Headache Medicine 2024, 15(2):86-91 ▪ p-ISSN 2178-7468, e-ISSN 2763-6178

Headache Medicine

▪ DOI: 10.48208/HeadacheMed.2024.18

Original

Medical innovation in the Amazon: the first university headache clinic

Átila Barros Magalhães[1], Samuel Oliveira de Amorim[1], Matheus da Silva Ferreira[1], Matheus da Silveira Maia[1], Thyerre Castro Coelho[1], Ana Karoline Pereira Camarão[1], Marcos Manoel Honorato[1]

Centro de Ciências Biológicas e da Saúde, Universidade do Estado do Pará, Santarém, Pará, Brazil

Átila Barros Magalhães
atila.barros@hotmail.com

Edited by:
Marcelo Moraes Valença

Abstract

Introduction
Headache is one of the main neurological complaints worldwide. In Brazil, the lack of specialized centers, especially in less developed regions, hinders adequate treatment, impacting the health and quality of life of these populations.
Objective
To report the implementation of the first university headache clinic in the Brazilian Amazon.
Methods
This experience report aims to identify, record, and analyze characteristics, factors, or variables related to the implementation of a headache clinic in the Brazilian Amazon.
Results
The Amazon Headache Clinic, a pioneer in the region, served 70 patients between May 2023 and February 2024. Fifty-eight patients are under continuous follow-up, while 36 are awaiting their first appointment. Preliminary data show a higher presence of females, with an average age of 37.96 years, predominantly students, and a diagnosis of episodic migraine without aura. Both in-person and telemedicine consultations prioritize financially disadvantaged patients, promoting accessibility to specialized headache treatment. The service, provided in-person in the city of Santarém and via telemedicine to riverside communities, represents a significant advancement in headache management in the region, significantly improving patients' quality of life. Medical students and residents accompany specialists, contributing to their practical healthcare training.
Conclusion
The inauguration of the first headache clinic in the Amazon marks an important milestone in regional healthcare and medical research. In addition to filling a gap in the treatment of these conditions, it promotes the training of local professionals, improves patients' quality of life, and drives advances in healthcare.

Keywords:
Outpatient care
Headache
Amazon

Submitted: March 4, 2024
Accepted: April 18, 2024
Published online: June 15, 2024

Introduction

Headaches stand out as one of the main scourges in medical practice, constituting the most frequent neurological complaint worldwide (1). The disorders associated with headaches are influenced by a variety of factors, such as genetic predisposition, environmental influences, and lifestyle habits. This condition affects a wide range of people, covering various age groups, and is a significant public health problem (2).

In the global context, as elsewhere in the world, Brazil faces significant challenges when it comes to the treatment, management, and prevention of headache disorders. These difficulties are mainly related to the lack of specialized centers in the country's public healthcare system, especially in less developed regions such as the northern and northeastern states (3). This shortage means that thousands of people do not have access to proper support. It is estimated that 15.2% of the adult and economically active population in Brazil experience headaches, which has a direct impact on the quality of life of countless individuals (4).

This paper reports on the experience of setting up the first university headache clinic in the Brazilian Amazon, with the aim of filling this gap and improving access to specialized treatment in the region.

Methods

Research Site

This study was carried out in the city of Santarém, in the western region of the state of Pará, Brazil. With a territorial area of 17,898 km^2 and an estimated population of 331,942 inhabitants (5), this city is home to campus XII of the State University of Pará, where the first university headache clinic in the Brazilian Amazon was set up.

Study Type

This was a descriptive study with a qualitative approach. Since this study does not pose any risk of revealing the personal identities of its subjects, it was not necessary to obtain approval from an ethics and research committee.

Activities

The sessions take place once a week in the morning and afternoon in a room on the premises of campus XII of the State University of Pará in Santarém. They are scheduled by a team made up of students via instant message app. The criteria for scheduling at the outpatient clinic include: 1) the main complaint of headache; 2) referral via the Brazilian Unified Health System (SUS); and 3) the patient's lack of financial means.

Consultations take place in two ways: face-to-face and via telemedicine. Telemedicine was implemented due to the region in which the clinic is located, where there is considerable difficulty in accessing health care for the riverside, indigenous and quilombola populations. To this end, telemedicine care has been implemented in two riverside communities in the city of Santarém. This is done by means of a computer with Internet installed in the Basic Health Unit (UBS) of the communities - an initiative supported by the local health department - and another in the outpatient room at UEPA, allowing patients access to cephalgia consultations, despite the distance from their place of residence.

An average of 12 patients are seen every day, divided into 6 visits in the morning (2 via telemedicine and 4 in person) and 6 visits in the afternoon (2 via telemedicine and 4 in person), including returns and new consultations. Return visits take an average of 30 minutes, whereas new patient consultations take 60 minutes.

During the consultations, a specialist doctor participates - a neurologist or a neurosurgeon, students from the fourth semester of the medical course (on the morning shift) - who rotate weekly in two groups of 10 students. And, on the afternoon shift, interns from the medical course and residents in clinical medicine and family and community medicine from the first and second year of the same institution.

Patient care is divided into triage, a detailed patient history, a cephalic physical examination, case discussion and management. During screening, vital signs are taken and anthropometric measurements are checked. The anamnesis is divided into patient identification information, the main complaint, the history of the current illness, personal, family and nosological history. In order to standardize care and facilitate retrospective studies, a medical record has been drawn up which includes the main questions to be asked.

The cephalic physical exam used involves a neurological screening exam, which includes assessment of mental state, cranial nerves, including fundoscopy using a portable retinography, palpation of pericrania and neck structures, cervical and oral biomechanics, deep tendon reflexes, muscle strength, coordination, balance, and gait. The case discussion is a crucial and very important stage in the service, as the students and residents are encouraged to practice clinical reasoning in order to propose a course of action based on the best evidence for the patient's situation. At this time, the preceptor asks questions about the diagnosis and management of the headache and allows students and residents to raise any doubts they may have.

After their case has been discussed, the patient is advised of their diagnostic hypotheses, and after a shared decision is made between the team and the patient, the course of action is defined and, subsequently, requests for tests, referrals and prescriptions are filled out by the trainees under the supervision of the preceptor.

As this is a university outpatient clinic, we have implemented a continuing education program in migraine. This takes place once a week on the same day as the outpatient clinic in the evening (from 6 pm to 8 pm every Tuesday).

The class is divided into two stages. The first involves a presentation by an intern and/or resident who is on the rotation on a subject previously defined by the outpatient clinic's preceptors. This is followed by a discussion on the subject, with time to answer any questions the participants may have. The second refers to a class given by one of the preceptors, which serves as an in-depth study of the topic previously explained by the intern.

This continuing education program in headaches is extremely important, as it enables the participants to make the best possible use of their care, combining theoretical and practical knowledge. The entire class schedule is based on themes proposed by the *International Headache Society* (6).

Results

The Amazon Headache Outpatient Clinic is pioneering in the management of headaches in a university outpatient setting, being the first in the Brazilian Amazon and in the north of the country.

The main advantage of telemedicine is that it reaches individuals living in distant areas, while the biggest challenge is that it is impossible to carry out a complete neurological examination, leading us to try to adapt the usual physical examination, which is not always sufficient. In traditional medical consultations, students and residents follow the preceptor's care and actively participate in the discussion of the clinical case and can practice cephalometric anamnesis, recording in medical records, prescribing prescriptions, neurological examination, and the doctor-patient relationship. In this way, theoretical knowledge is combined with clinical practice and teaching-service-community interaction is privileged, making a major contribution to the training of future health professionals.

Between May 2023 and February 2024, a total of 70 patients were seen. Currently, 58 remain in continuous follow-up and 36 are waiting in the line for their first appointment at the headache clinic.

Preliminary data from the first four months of attendance at the outpatient clinic (with n = 33) revealed a greater presence of female patients (90.91%) with an average age of 37.96 years. Students predominated (30.30%). Regarding the diagnoses made, most were primary headaches (93.94%), with migraine without aura (54.54%), external pressure headache (39.39%) and migraine related to menstruation (36.36%) being the most common. It is important to note that the same patient can have more than one type of headache. There were diagnoses of less common headaches, such as nummular headache and hypnic headache. This information is shown in Table 1.

Table 1: Preliminary data on patients seen at the first Amazon Headache Outpatient Clinic.

Variable		n	%
Sex			
	Male	3	9.09
	Female	30	90.91
	Total	33	100.00
Occupation			
	Student	10	30.30
	Administrator	2	6.06
	Self-employed	2	6.06
	Retailers	2	6.06
	Houseworkers	2	6.06
	Civil servants	2	6.06
	Other professions	2	6.06
	Total	33	100.00
Headache type			
	Primary	31	93.94
	Secondary	2	6.06
	Total	33	100.00

Figure 1 is made up of photographic records taken during the activities of the Amazon Headache Outpatient Clinic.

"Figure 1. Photographic records of telemedicine consultations (1), scientific presentation (2), workshop on botulinum toxin application (3), extension project (4), and residents' class (5)."

Discussion

Reality of health care in the Brazilian Amazon

The Brazilian Amazon, also known as the Legal Amazon, corresponds to a wide geographical area, including

the states: Acre (AC), Amapá (AP), Amazonas (AM), Maranhão (MA), Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR) and Tocantins (TO) (7), with a territory of approximately 5 million km² (5).

This scenario, combined with the low demographic density of the states within this region (5), shows a reality in which there is a significant distance between municipalities. This has a direct impact on health conditions in the region, since these geographical barriers limit the provision of inland actions and access to health, whether in primary or medium and high-complexity care, which are concentrated in the capital cities (8, 9).

In addition, there is a significant shortage of specialist and non-specialist medical professionals in the interior of the Amazon, with an average of 0.4 doctors per thousand inhabitants (10), making it extremely difficult for many patients to access care and leaving them with no possibility of properly monitoring the illnesses that affect them.

Headaches are frequent and very disabling complaints, affecting millions of people in all countries and regions of the world, regardless of age, gender, race, or income level (1). In this sense, given the limited access to specialized cephaliatric care in the Brazilian Amazon, there was a need to establish an intervention mechanism capable of mitigating this reality.

Pioneering the creation of the Amazon Headache Clinic

The month of May (May Bordeaux) is allusive to combating headaches (11). In May 2023, driven by a restlessness of his own, the professor of the UEPA Dr. Átila Barros Magalhães, a neurosurgeon with undergraduate and postgraduate degrees in the Amazon, proposed a regional campaign in and around Santarém to raise awareness of and combat headaches, including a symposium on headaches and orofacial pain and the opening of cephaliatric care for students and professors at the university.

With the support of the campus coordinators and all the logistical help provided by the student members of the Tapajós Neurology and Neurosurgery Academic League (Neuroliga), in a prototype outpatient clinic improvised in a classroom provided by the university, 20 places were offered for cephaliatric care, by free and spontaneous demand, which were quickly filled. The impact of the appointments on the patients' lives was so significant and the initiative grew to such an extent that the small campaign gave way to continuous scheduling, and so we set up the first Cephalalgia Outpatient Clinic in the Amazon. Through efforts to raise funds for the clinic through events at the university and in partnership with the university's campus coordination, it was possible to move the clinic to a more suitable room. With a room, two tables, four chairs, two computers, a screen and a bookshelf, the university offered support with the premises. With the money from the symposium, we installed an air conditioning unit. And so, our activities began.

Attendance was limited to one shift, with the participation of fourth semester medical students. The demand for appointments grew enormously to the point where a waiting list had to be created. At the beginning, there were difficulties in finding space for the cephaliatric appointments.

As a result, the shifts were expanded, and the participation of internship and residency students was implemented. With more shifts, there was a greater supply of appointments to reduce the waiting list. This expansion of the outpatient clinic led to a significant increase in public cephaliatric care in the region, which had previously been deficient.

In addition, this broadening of the participants made it possible to arouse interest in the study of headaches in academics, as well as a way for teachers to advise on the importance of taking a detailed semiological approach, including anamnesis and cephalic physical exam to differentiate primary from secondary headaches (12), with an understanding of clinical management and the need for complementary exams, from more well-known and elucidated conditions such as migraine to those less understood by professionals, such as trigeminal-autonomic headaches.

No records were found of other headache clinics in the Brazilian Amazon region. From this perspective, we would like to highlight the pioneering nature of the creation of this clinic, which is an important factor that can encourage the creation of other clinics in other parts of the Brazilian Amazon.

Creation of the Amazonian Headache Laboratory

The work of the clinic within the university context has grown significantly, with the participation of many students who have become interested in cephaliatry (Headache Medicine). As a result, the Amazon Headache Laboratory (LCA) was created with the aim of expanding the work of the Amazon Headache Outpatient Clinic, integrating patient care, teaching, research, and extension.

In December 2023, the process of institutionalizing the LCA at the State University of Pará (UEPA) began. With this process, it was possible to expand the possibilities for cephaliatric research in the region. In addition, it was possible to promote extension projects with the community and to carry out the Continuing Education Program in Cephalalgia.

The reality of headaches in the Amazon context is not fully understood precisely because of the lack of research on the subject in the region. The LCA is an important tool for the scientific community to better understand the characteristics of headaches in the region, not only by limiting itself to research, but also by providing quality care for patients. Preliminary data from consultations already shows that the population treated is female, which is in line with previous population studies (13). Previous investigations involving headaches in the Amazonian population have shown that there is a significant prevalence of headaches in students (14), this represents an important population for further research. The greater presence of primary headaches, especially migraine, is like what has been described in the literature, since migraine is a disabling primary headache that causes many patients to seek cephaliatric care (15, 16).

Research into the epidemiological characteristics of patients is underway in order to obtain more consistent data.

In addition to medical consultations, multi-professional care was also implemented at the LCA, including physiotherapy and psychology, given the great relevance of these professionals to headache management.

Currently, the shortage of cephaliatric care is not fully addressed in the Amazon region, as it is not yet feasible for an outpatient clinic to provide enough care for a region with a large territorial extension. In this sense, it is crucial to create other cephaliatric outpatient clinics in other states of the Brazilian Amazon.

Conclusion

The opening of the first Headache Outpatient Clinic/ Laboratory in the Brazilian Amazon marks a significant advance in local health and medical research. As well as filling a gap in the diagnosis and treatment of headaches, it aims to train local health professionals and contribute to the advancement of scientific knowledge in the area. By focusing on a widespread and debilitating health condition, it has the potential to help improve patients' quality of life, alleviating their suffering and the costs associated with inadequate treatment. It also promotes interdisciplinary and international collaboration, facilitating the exchange of knowledge between local experts and those from other parts of the world. In short, it represents a significant step towards more effective and accessible healthcare in the Amazon region, with invaluable benefits for those who suffer from headaches. Through its commitment to ongoing research, teaching, and the treatment of these conditions, it has the potential to significantly improve the quality of life of local inhabitants and establish a model to be followed in other areas of medicine and scientific research.

Átila Barros Magalhães
https://orcid.org/0000-0003-2930-9530
Samuel Oliveira de Amorim
https://orcid.org/0009-0001-2679-2232
Matheus da Silva Ferreira
https://orcid.org/0009-0009-1931-015X
Matheus da Silveira Maia
https://orcid.org/0000-0002-2540-95884
Thyerre Castro Coelho
https://orcid.org/0009-0002-6325-6372
Ana Karoline Pereira Camarão
https://orcid.org/0009-0003-1406-8778
Marcos Manoel Honorato
https://orcid.org/0000-0002-9700-9938

Author contributions: Amorim SO, Ferreira MS, Maia MS, Camarão AKP designed the initial writing of the article. Honorato MM and Magalhães AB designed the manuscript and critically reviewed the article and approved the version for submission.

Conflicts of interest: the authors declare that there is no conflict of interest.

Funding: This research did not receive specific funding from any funding agency in the public, commercial, or not-for-profit sectors.

References

1. World Health Organization: WHO. Headache disorders 2016 [Available from: https://www.who.int/news-room/fact-sheets/detail/headache-disorders Acesso em: 25 de fevereiro de 2024.
2. Cohen F, Bobker S. From diet to disasters, lifestyle factors can affect headaches and migraine. Headache: The Journal of Head and Face Pain. 2023;63(6):712-3.Doi 10.1111/head.14500
3. Valença MM. The challenges of migraine care in Brazil: from tertiary centers to public health realities. Headache Medicine. 2023;14(4):174-5.Doi 10.48208/HeadacheMed.2023.31
4. Queiroz LP, Peres MFP, Piovesan EJ, Kowacs F, Ciciarelli MC, Souza JA, et al. A Nationwide Population-Based Study of Migraine in Brazil. Cephalalgia. 2009;29(6):642-9.Doi 10.1111/j.1468-2982.2008.01782.x
5. IBGE – Instituto Brasileiro de Geografia e Estatística. [Internet]. Censo Brasileiro de 2022 [cited 2024].
6. The International Headache Society's Core Curriculum on Headache for Neurologists. British Journal of Pain. 2012;6(3):103-5.Doi 10.1177/2049463712454809
7. IBGE - Instituto Brasileiro de Geografia e Estatística [Internet]. Amazônia Legal 2022 [cited 25 de fevereiro de 2024]. Available from: https://geoftp.ibge.gov.br/organizacao_do_territorio/estrutura_territorial/amazonia_legal/2022/Mapa_da_Amazonia_

Legal_2022_sem_sedes.pdf.
8. Louvison MCP. Regionalização dos sistemas de saúde como resposta às desigualdades territoriais: um debate necessário. Cadernos de Saúde Pública. 2019;35(suppl 2).Doi 10.1590/0102-311x00116019
9. Garnelo L. Especificidades e desafios das políticas públicas de saúde na Amazônia. Cadernos de Saúde Pública. 2019;35(12).Doi 10.1590/0102-311x00220519
10. Silveira RP, Pinheiro R. Entendendo a necessidade de médicos no interior da Amazônia - Brasil. Revista Brasileira de Educação Médica. 2014;38(4):451-9. Doi 10.1590/s0100-55022014000400006
11. Sociedade Brasileira de Cefaleias: SBCE [Internet]. 19 de Maio: Dia Nacional de Combate às Dores de Cabeça [cited 26 de fevereiro de 2024]. Available from: https://sbcefaleia.com.br/noticias.php?id=484.
12. Donohoe CD. The Role of the Physical Examination in the Evaluation of Headache. Medical Clinics of North America. 2013;97(2):197-216.Doi 10.1016/j.mcna.2012.12.010
13. Peris F, Donoghue S, Torres F, Mian A, Wöber C. Towards improved migraine management: Determining potential trigger factors in individual patients. Cephalalgia. 2016;37(5):452-63.Doi 10.1177/0333102416649761
14. Sousa MRd, Silva Filho ES, Honorato MM, Cremaschi RC, Coelho FM. Prevalência de enxaqueca e a relação com o consumo de café entre acadêmicos e professores de uma universidade. Revista de Ciências Médicas e Biológicas. 2023;22(4):660-4. Doi 10.9771/cmbio.v22i4.53076
15. Yoon MS, Katsarava Z, Obermann M, Fritsche G, Oezyurt M, Kaesewinkel K, et al. Prevalence of primary headaches in Germany: results of the German Headache Consortium Study. The Journal of Headache and Pain. 2012;13(3):215-23.Doi 10.1007/s10194-012-0425-x
16. Stovner LJ, Hagen K, Linde M, Steiner TJ. The global prevalence of headache: an update, with analysis of the influences of methodological factors on prevalence estimates. The Journal of Headache and Pain. 2022;23(1).Doi 10.1186/s10194-022-01402-2