

# Evaluation of medical management in the treatment of headache in the urgency and emergency room of the Hospital Regional de Barbacena – MG

## *Avaliação do manejo médico no atendimento de cefaleia na sala de urgência e emergência do Hospital Regional de Barbacena – MG*

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### ABSTRACT

**Introduction:** Detailed clinical evaluation should be the basis for the proper management of headaches in emergency rooms, in order to allow adequate diagnosis and treatment. However, this is not usually observed on clinical rounds. **Objective:** To evaluate the management of headache consultations in an emergency rooms. **Methods:** This is a cross-section study was performed analyzing data from 1,317 electronic medical records of patients with headache complaints who sought treatment at the Barbacena City Regional Hospital's between January 1, 2017, and June 20, 2019. Medical records were classified according to the International Classification of Headache Disorders (ICHD-3). The data collected were statistically analyzed using chi-square tests. The study considered a  $p\text{-value} \leq 0.05$  to define statistically significant differences. **Results:** Three medical records were excluded and 1,314 were analyzed. Among the medical records analyzed, 73.21% of initial diagnoses were classified as headache, 16.67% as migraine, and 10.12% as tension-type headache. Headache corresponded to 59.76% of final diagnoses, migraine to 17.95%, and tension-type headache to 8.52%. Regarding the treatment, 43.99% of patients were prescribed opioids for the remaining were prescribed non-opioid medications. **Conclusion:** The study suggests that the management of headaches is inadequate in emergency rooms, probably due to limited knowledge of health professionals about headache. This resulted in a large number of nonspecific diagnoses and inadequate therapeutic approaches.

**Keywords:** Headache; Headache in Urgency Care; Opioid Analgesics.

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## RESUMO

**Introdução:** O manejo da cefaleia nas salas de urgência e emergência deve ser baseada em uma anamnese detalhada para que o diagnóstico e tratamento sejam adequados, entretanto não é o que se encontra nos atendimentos. **Objetivo:** Avaliar o manejo do atendimento das cefaleias em uma sala de Urgência e Emergência. **Métodos:** Estudo de corte transversal retrospectivo, realizado através da análise de dados de 1317 prontuários eletrônicos de pacientes com queixa de cefaleia que procuraram o serviço de emergência do Hospital Regional de Barbacena durante o período de 01 de janeiro de 2017 a 30 de junho de 2019. Os diagnósticos relatados nos prontuários foram classificados de acordo com os critérios da Classificação Internacional das Cefaleias (ICHD-3). Os dados foram submetidos à análise estatísticas, pelo teste de qui-quadrado. Considerou-se diferenças estatisticamente significativas aquelas cujo valor  $p \leq 0,05$ . **Resultados:** Do total de prontuários, três foram excluídos, sendo analisados 1314. Entre os prontuários analisados, 73,21% apresentaram diagnósticos iniciais eram cefaleia, 16,67% migrânea e 10,12% cefaleia do tipo tensão. Já no diagnóstico final, cefaleia correspondeu a 59,67%, migrânea a 17,95% e cefaleia do tipo tensão a 8,52%. Em relação ao tratamento, foi receitado opioides para 43,99% dos pacientes e para o restante foram prescritos medicamentos não opioides. **Conclusão:** O trabalho sugeriu falha no manejo da cefaleia nas salas de urgência e emergência, provavelmente pela limitação do conhecimento dos profissionais de saúde acerca da dor de cabeça. O que acarretou no grande número de diagnósticos inespecíficos e inadequada abordagem terapêutica.

**Palavras-chave:** Cefaleia; Cefaleia na Urgência; Analgésicos Opioides.

## INTRODUCTION

Headache is a universal symptom and affects a significant portion of the general population. The annual prevalence of headache is estimated at 94% among men and 99% among women. It is also a common symptom in emergency rooms, prompting a high number of emergency consultations.<sup>1</sup>

To ensure the specific management of headache can be achieved, diagnoses should be based on a complete clinical evaluation that takes into consideration all related complaints and necessary complementary investigation. However, this is not observed on Brazilian clinical rounds, since most patients are referred by the units. basics for diagnostic clarification only.<sup>1,2</sup>

In public hospitals in Brazil, negligence during clinical rounds causes the majority of primary headache treatment to consist of the usage of analgesics and parenteral non-steroidal anti-inflammatory drugs (NSAIDs) for primary headaches, whereas the headache protocol suggests specific medication for different types of headaches.<sup>3</sup>

The approach to patients with headache complaints must always be, performed based on a detailed clinical evaluation to result in adequate diagnosis and treatment.<sup>4,5</sup>

Thus, this study aims to evaluate the management of headache care in the emergency rooms of Dr. José Américo Barbacena City Regional Hospital, which belongs to the FHEMIG healthcare network.

## METHODS

A cross-section retrospective qualitative study was performed analyzing medical records based on the probable diagnosis and the management of patients who sought the emergency care service at the Barbacena City Regional Hospital from January 1, 2017, to June 30, 2019.

Dr. José Américo Barbacena City Regional Hospital is a public hospital and belongs to the Hospital Foundation of Minas Gerais State (FHEMIG). It provides specialized care to the adult population in to a geographic region encompassing 53 cities with approximately 700,000 inhabitants. It is a reference to other medium and high-complexity institutions.

The hospital's emergency room is also open to incoming spontaneous demand.

Prior to medical evaluation, priorities are identified using the Manchester Triage System, to which all patients seen in the hospital's emergency room are assessed.<sup>6</sup> Upon a patient's arrival in the emergency care unit, a nurse assesses the complaints and the signs and symptoms presented by the patient. Following the triage, the patient is classified within a priority scale organized in colors. On that basis, the patient is subjected to a clinical evaluation performed by an emergency physician on duty. Patients' data are electronically recorded in an internal medical records software.

The study included medical records of patients who attended the emergency room of Dr. José Américo Barbacena City Regional Hospital, regardless of sex, who were registered in their electronic medical records with the following codes from the International Classification of Diseases (ICD-10).<sup>7</sup>

- G43: Migraine
- G43.0: Migraine without aura (common migraine)
- G43.1: Migraine with aura (classic migraine)
- G43.3: Complicated Migraine
- G43.8: Other migraine
- G43.9: Migraine, unspecified
- G44: Other headache syndromes
- G44.1: Vascular headache, not elsewhere classified
- G44.2: Tension-type headache
- G44.3: Chronic post-traumatic headache
- G44.4: Drug-induced headache, not elsewhere classified
- G44.8: Other specified headache syndromes
- R51: Headache

Medical records with inconsistent information, such as data duplication, were excluded. Other types of primary headache were also excluded, as the initial care was provided by the triagist and/or the physician on duty.

The following data were obtained from the medical records: age, sex, place of origin, initial diagnosis (assessed during triage), neurological exam data (level of consciousness, cranial nerves examinations, sensor and motor examination, coordination, reflex testes and meningeal signs assessment), laboratory tests, including cerebrospinal fluid (CSF) and neuroimaging (cranial computed tomography scan), definite diagnosis determined by a general practitioner, prescribed treatment and patient discharge information. The data selection was based on the Neurological System Unit Protocol.<sup>8</sup>

The data obtained were classified according to the diagnostic criteria provided by the International Classification of Headache Disorders (ICHD-3), by the researchers. Headache diagnoses were classified into three subgroups: tension-type headache, migraine, and secondary headache. Following subgroup classification, the initial diagnosis determined by a nurse, and the definite diagnosis at discharge, determined by the physician were compared. The study analyzed the adopted management regarding the

definite diagnosis, the prevalence of headache according to age and sex, and the association between neurological examination and neuroimaging. The authors interfered in neither the diagnosis nor the adopted treatment.

This research was approved by the Barbacena Faculty of Medicine Research Ethics committee, as stated in the technical report number 3,686,262.

## DATA ANALYSIS

Data from the questionnaires applied in this study were transcribed into an electronic spreadsheet and processed in the statistical software STATA v 9.2. Relative and absolute distributions were calculated for qualitative variables. The association between the studied variables was estimated using the Pearson chi-square test. The agreement was estimated using Kappa statistics. The study considered statistically significant differences those with  $p$  value  $\leq 0.05$ .

## RESULTS

This study assessed a total of 1,317 electronic medical records from the Barbacena City Regional Hospital, which dated from January 1, 2017, to June 30, 2019. Among those, three medical records were excluded due to data inconsistencies. During this period, there were 51,285 consultations in the hospital, 2.56% of which corresponded to headache-related consultations in the emergency room. These corresponded to all the cases of headaches on medical records registered in the institution within this timeframe.

The demographic profile found in the study was predominantly female: 864 patients were women (65.35%) and 450 were men (34.25%). Patients' ages varied from 11 to 92 years, with a predominance of 75.35% between the ages of 21 and 60 years, with an average corresponding to 39 years with a standard deviation of 16.3.

Of the 1,314 analysed records, neurological examination was recorded in 1,033 and deemed abnormal in 110 records. Two hundred eighty-one records were not subjected to these exams. Diagnostic imaging was not requested for 1,068 of the records.

Subsequent neuroimaging exams were performed for 65.45% of abnormal neurological exams. 84.94% of normal neurological exams did not lead to the request for neuroimaging (table 1).

The initial headache (ICD-10 R51) diagnosis was found in 962 (73.21%) of the analyzed medical records; migraine (ICD-10 G43) was present in 219 (16.7%); and tension-type headache (ICD-10 G44.2) in 133 of patients (10.12%). Definite diagnosis confirmed 784 (59.67%) headache cases, 236 (17.95%) migraine cases, and 112 (8.52%) tension-type headache cases. For 182 patients (13.86%), the headache diagnosis was not confirmed.

Regarding the analyzed medical records with an initial diagnosis indicating headache (ICD-10 R51), 81.19% actually corresponded to a definite headache diagnosis. Among the initial diagnosis indicating tension-type headache (ICD-10 G44.2), 81.95% were confirmed. Finally, among

**Table 1.** Relationship between neurological examinations and neuroimaging requested from patients with an initial diagnosis of headache at the Barbacena City Regional Hospital - MG.

		Neuroimaging		
		Not requested	Requested	Total
Neurological exam	Abnormal	38 34.55%	72 65.45%	110 100.00%
	Normal	779 84.40%	144 15.60%	923 100.00%
	Not performed	251 89.32%	30 10.68%	281 100.00%
Total		1.068 81.28%	246 18.72%	1.314 100.00%

$p < 0.001$ .

**Table 2.** Association between initial and final diagnosis for patients with initial diagnosis of headache at Barbacena City Regional Hospital - MG, regarding the aforementioned ICD codes.

		Initial Diagnosis			
		Headache	Tension-type headache	Migraine	Total
Final Diagnosis	Headache (R51)	574.7 81.19%	79.5 2.26%	130.8 0.46%	785.0 59.74%
	Tension-type headache (G44.2)	82.0 0.31%	11.3 81.95%	18.7 0.00%	112.0 8.52%
	Migraine (G43)	172.8 2.49%	23.9 0.75%	39.3 96.35%	236.0 17.96%
	Not headache	132.5 16.01%	18.3 15.04%	30.2 3.20%	181.0 13.77%
Total		962.0 100.00%	133.0 100.00%	219.0 100.00%	1.314.0 100.00%

$p < 0.001$

Note: Result showed a 83.8% agreement and kappa equal to 0.69 ( $p < 0.001$ )

the initial diagnosis indicating migraine (ICD-10 G43), 96.35% were confirmed in the definite diagnosis. The type of diagnosis indicated by triage was confirmed in 86.23% of definite diagnoses (table 2), with an 83.8% agreement and Kappa value of 0.69.

Regarding treatment regimens, opioids were used in 578 records and non-opioids analgesics were used in 736 records.

Finally, out of the 1,314 assessed medical records, 1,270 records were discharged, 25 transfers, seven hospitalizations, six evasions and six other deaths. Hospitalizations, transfers, and deaths were caused by complications of secondary headaches, such as intracranial hemorrhages (intraparenchymal and/or subarachnoid hemorrhage).

## DISCUSSION

Headache is one of the most common complaints in Urgency and Emergency rooms. In this study, headache

complaints corresponded to 2,56% of visits in Barbacena City Regional Hospital, a rate similar to those found in previous studies which described an incidence between 2 and 2,3%.<sup>1,9,10,11</sup> In the face of this incidence, this study proposed the evaluation of how the management of headache is performed in a regional referral center. Results showed that a large part of headache diagnosis was not aligned with the International Classification of Headache Disorders (ICHD-3).<sup>2</sup> Findings also demonstrated the adoption of inadequate treatment.

This study also showed that the majority of requested neuroimaging exams were based on neurological exams that presented warning signs, as described by Minen MT et al<sup>10</sup>. Patients who arrive at the emergency room should undergo a detailed clinical neurological examination, so that severity signs that require imaging exams can be identified.<sup>10</sup>

However, in Urgency and Emergency rooms, patient care requires agility in determining the severity of patients'

conditions and in assisting a large number of patients, which causes anamnesis and clinical exams to not be properly performed. This leads to unspecified diagnosis and interferes in the adequate management of headache, which involves diverse factors.<sup>12</sup>

To ensure adequate management, patient care should be based on ICHD-3, which supports the initial and definite diagnosis, prognosis, and treatment of different types of primary and secondary headaches. Yet, ICHD-3 is rarely used in clinical practice, which suggests health professionals' lack of knowledge regarding headache classification. As a consequence, a large part of patients receives "headache" and "headache unspecified" diagnoses.<sup>2,13</sup> According to previous studies, 38 to 45% of patients received unspecified diagnoses. In the present study, only 18,81% of the diagnoses fit ICHD-3.<sup>2,14,15,16</sup>

Since treatment should be based on the type of headache, misdiagnosis impacts the therapeutic approach. Forms of treatment found in Urgency and Emergency Units vary between institutions and there is no universally accepted protocol, neither in Brazil nor globally. However, in Brazilian hospitals, the most used drugs regimens are analgesics, parenteral NSAIDs and opioids.<sup>1,12</sup>

In Brazil, opioids, especially tramadol, are the third most frequently used pharmacological agent for the treatment of headaches. This study found that opioids were prescribed for 43.99% of acute headache patients. Similar data were found by Krymchantowski et al<sup>16</sup> in the region of the Brazilian cities Rio de Janeiro e Teresina, where 51.2% of patients received opioids on the emergency consultations.<sup>16</sup>

There is no formal indication for the use of opioids in the treatment of acute headaches, and they are not more efficient than common analgesics. Moreover, opioids may cause dependence, tolerance, and headache due to excessive use, and present side effects such as urinary retention, constipation, seizures, and even respiratory depression. As shown by McCarthy and Cowan<sup>18</sup>, opiate use is associated with an extended length of hospitalization in comparison to non-opiate medications. Therefore, opioid use is not recommended for the treatment of primary headache in the emergency room.<sup>12,17,18</sup>

Various authors recommend as first-line treatment for primary headaches non-opiate parenteral analgesics, serotonin receptors modulators (e.g. triptans), antiemetics, dopamine antagonists, and NSAIDs.<sup>18</sup> This study observed the use of these types of medications in 56.01% of patients.

This study presents limitations such as the use of retrospective data to infer the physician's definite diagnosis and the incompleteness of data found in some medical records, which jeopardizes critical analysis. Another limitation of this work is the use of ICD on medical records to define the headache type. This codification system is limited and does not comprise all the headache subtypes described by ICHD-3. A limitation is the description of the neuroimaging reports, regarding the details of the abnormal neurological exams, although many of the altered exams are not related to the headache.

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## CONCLUSION

The data obtained in this study showed that there might be a limitation in the codification system - an incoherence between ICD and ICHD-3 - or that, possibly, health professionals lack knowledge regarding the different types of headaches. In this study, a minority of diagnoses fit ICHD-3.

This study showed that most patients received inadequate treatment for the presented condition due to the large number of diagnoses that were not classified under ICHD-3 criteria. Thus, this study suggests a failure in the management of headache treatment in the emergency setting.

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## AUTHOR'S CONTRIBUTION

We describe contributions to the papers using the taxonomy (CRediT) provide above: Conceptualization, Investigation, Methodology, Visualization & Writing – review & editing: Heleno, EG; Nascimento, ICM; Pereira, MLF; Almeida, MMS; Pereira, RR. Project administration, Supervision & Writing – original draft: Heleno, EG; Nascimento, ICM; Pereira, MLF; Almeida, MMS; Pereira, RR. Validation&Software: Jurno, ME. Data curation & Formal Analysis: Jurno, ME.

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