



Identification of the Location of Migraine Pain in an Adult Population of a Tertiary Care Hospital: A Cross-Sectional Study

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ABSTRACT

Introduction: Headache is the most common disorder that occurs in the general population and affects half of the world's population. Several reasons have been associated with the cause of this disorder. It is one of the most regularly seen medical symptoms in many specialties in outpatient departments of hospitals. Migraine and Tension-type headache (TTH) are prevalent disorders, and in 2013 migraine was identified as the 6th common cause of disability.

Aim: To identify the location of migraine pain in an adult population of a tertiary care hospital:

Methodology: This study included 870 patients with migraine for more than 6 months duration. The data were collected through a semi-structured questionnaire, and the patients that were on any medication and had 2 attacks of migraine each month were included in the study. ICHD-2 criteria were used to diagnose migraine and their subtypes. The assessment was performed at several stages:

Results: In total, 870 patients, 350 (40.3%) were males, and 520 (59.7%) were females. The mean age of patients was 24 years, and the mean duration of migraine was 5.6 years. In our study, 66% of patients were Sindhi, 27 % were Punjabi, and 7% belonged to other ethnic groups. A total of 49% of patients were experiencing unilateral onset in which ocular, frontal and temporal were observed as 50%, 11%, and 39%, respectively. Bilateral/central pain, typically bitemporal or at the vertex, was mentioned in 26% of the patients. In 25% of patients, the start of cervicocapital discomfort was reported.

Conclusions: This study inspects the site of pain in migraine patients during the onset and established migraines. More than half of the participants reported discomfort in the cervicocapital area and bilaterally/centrally.

Key Words: Headache, Migraine, Discomforts, Unilateral, Pain location, Cervicocapital

INTRODUCTION

Headache is the most common disorder that occurs in the general population and affected half of the world's population. Several reasons have been associated with the cause of this disorder. It is one of the most regularly seen medical symptoms in many specialties in outpatient departments of hospitals.¹ Migraine and Tension-type headache (TTH) are prevalent disorders, and in 2013 migraine was identified as the 6th common cause of disability.² The hemi cranial site of pain has been a core aspect of acute migraine attacks from the earliest times, and the term migraine was derived from

this discovery.³ This belief has endured for centuries, and the diagnostic criteria for migraine, the International Headache Society (IHS), has incorporated a unilateral site of pain (both without and with a typical aura) in the International Classifications of Headache Disorders (ICHD-1 and ICHD-2) conducted in 1988 and 2004, correspondingly.⁴ Migraine has been linked to various health issues and disorders, including irritable bowel syndrome, epilepsy, anemia, and menstruation. For a long time, premonitory symptoms related to migraine have been considered. It is a collection of non-painful symptoms that appear hours or days before the actual event. They serve as a warning for a migraine attack, but they also

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ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 18.03.2022

Revised: 08.04.2022

Accepted: 22.04.2022

Published: 03.05.2022

contribute to the anguish of the migraine's actual severe symptoms.⁵

However, a review of published papers reveals that the onset, spread, and final site of migraine pain during established headaches has yet to be researched sufficiently, including a significant number of patients.^{6, 7} Even in a single person, experience reveals that the area of pain may not be consistent throughout attacks. Furthermore, ethnic heterogeneity in the places is a possibility. According to studies, migraine discomfort is hemicranial in about 60% of cases.⁸ Various therapeutic approaches have also been tested to reduce the severity of these foreshadowing signs. Various recent research has focused on this intriguing phenomenon connected with migraine headaches.⁹ In a study conducted in the United Kingdom, migraine patients generally reported fatigue during the premonitory period.¹⁰ Around 85% of participants said they had premonitory symptoms of some kind or another in a similar study.¹¹ In a recent study, fatigue and mood changes were the most commonly reported symptoms in the premonitory phase by the pediatric population with migraine. These findings make this phenomenon extremely important for physicians who want to treat migraine as a complete rather than simply the headache and unpleasant symptoms.¹² Several neurochemicals have also been related to the premonitory phase of migraine and distinct brain locations. The effects of orexin, dopamine, cholecystokinin, anti-diuretic hormone (ADH), melatonin, and somatostatin on the symptoms of the premonitory phase have been examined. There was a scarcity of local data on this component of migraine headache.¹³

In both common and traditional migraine attacks, Sjaastad et al. found that the initial pain was localized in the temporal and forehead areas (ocular onset pain has been noted in connection with migraines without aura).^{14, 15} According to these authors, the unilaterally side shift of pain was evident in 75 percent of participants with collective migraine.¹⁶ These findings were made in a relatively small number of participants and may not apply to all ethnic groups or during all or at least the majority of migraine attacks in a person's lifetime. Very limited data is available on the location of migraine. So far, no publication has highlighted the site of migraine in the Pakistani population. This present study aims to reveal a subsequent location during an established headache in patients visiting a tertiary care hospital.

Study design: A cross-sectional study

Place and Duration: This study was conducted at KMC Civil Hospital Khairpur Mir's Pakistan from January 2020 to June 2021

Methodology

A total of 992 cases older than 15 years of age were included in the study. Permission was taken from the ethical review

committee of the institute. Patients with acute migraine were included. However, patients with chronic migraine were excluded from the trial. The data were collected through a semi-structured questionnaire, and the patients that were on any medication and had 2 attacks of migraine each month were included in the study. ICHD-2 criteria were used to diagnose migraine and their subtypes. The assessment was performed at several stages:

Each participant was evaluated to confirm migraine and identification of subtype then arrangement of related investigation to exclude headaches other than migraine (imaging was performed where necessary). The cases at the second visit were examined through a questionnaire evaluating pain onset, location site and subsequent location in well-known attacks in most cases (>50 percent) of headache episodes in the earlier 6 months. The patients were asked to place their hands at the locations of beginning pain, then indicate the spread of pain (if feasible), and lastly, the location of discomfort during the well-known headache phase with their hands. After this section, there are descriptions of the terminology linked with anatomical locations. During the third visit, all patients were asked similar questions again to compare the previous records. The cases who didn't present in the second and third visit were excluded. The cases in which discrepancies were noted were excluded from the present study. Only cases that were specific and consistent were included in the study. At the third stage, 122 cases were excluded, and 870 remained in our study. The pain was inadequately localized in most of these individuals at the outset and throughout the headache phase.

Patients with chronic migraine episodic migraine were excluded from the trial (ICHD-2 criteria). The pain was inadequately localized in most of these individuals at the outset and throughout the headache phase. It should be emphasized that the area most afflicted was considered while recording the location of discomfort, especially at the outset. For example, frontal onset refers to pain that affects one side of the forehead but extends somewhat into the temporal area and vice versa. Although this may appear to be a bit contrived, it was required to simplify the final analysis while keeping its value. SPSS version 23 was used to execute the data.

RESULTS

Table 1 summarizes the ethnic and demographic features of patients. Migraine without aura was experienced by 81.9% of the population; on the other hand, migraine with aura was only experienced in 5.1% of individuals.

Migraine with aura is considered infrequent in Pakistani patients, as shown in Table-1. Almost 49 % of subjects had a unilateral onset of migraine headache, of which 42.2% had pain in the onset of ocular location, and 39%

had pain in the onset of the temporal region. At the onset of migraine, 26% of subjects experienced bilateral/central (vertex) pain, 46.9% were facing bitemporal, followed by 27.8% experiencing the vertex region pain. Cervicooccipital region pain was experienced by 25% of patients, out of which occipital location onset was faced by 55%, and the cervical location was experienced by 45% of patients, as shown in Table-2.

It was difficult to differentiate between the occipital and cervical locations of pain onset. These two areas were combined and split into occipital and cervical ones in many cases. Unilateral pain was observed in 49% of the patients with frontal, temporal, and ocular regions of pain onset. In 42.2% of patients, the pain remained the same at the established migraine, whereas, in 43.1% of patients, pain shifted to the hemicranial region. In patients with bilateral/center, established migraine stayed the same for 74.4%, 44.5%, and 70.7% in categorizing bilateral central, bifrontal, and bitemporal patients. In the patients facing vertex or bilateral location of the pain at the onset (n =226), 33.4% of them established migraine location remained the same. Around 70.7% of the patients experienced the bitemporal onset of unbearable pain, persistently facing pain at the same site, but in about 50.7%, the pain became holocranial afterward. Approximately (50.7%) of the patients devouring onset pain at the vertex region consequently faced holocranial headaches. In patients with predominantly-occipital locations, about 47.5% of patients developed holocranial headaches afterward in established migraine. Hemicranial headaches were encountered by 37.2 percent of individuals with mostly cervical pain at the outset, but only 17.5 percent of those with predominantly occipital pain at the onset, as observed in Table-3.

Table 1: Demography of migraine in adult patients (n=870)

Description	Total cases
Male: Female	350:520
Age	15- 46 years (me= 24.8)
Duration of Migration	1-16 years (mean 5.6)
Migraine with aura	45 (5.1)
Migraine without aura	713 (81.9)
Probable migraine	112 (12.8)
Ethnicity	Sindhi = 561 (66%) Punjabi = 229 (27%) Others = 80 (7%)

Table 2: Pain location at the onset of migration (n=870)

Location	No. of cases (%)
Unilateral onset	426 (49)
Ocular	213 (50)
Frontal	47 (11)
Temporal	166 (39)
Laterality on onset	
Always left	73 (17.1)
Always right	47 (11)
50 % left	132 (30.9)
50% right	174 (40.8)
Bilateral/ Central onset	226 (26)
Bilateral ocular	39 (17.2)
Bifrontal	18 (7.9)
Bitemporal	106 (46.9)
Vertex	63 (27.8)
Cervicooccipital onset	218 (25)
Predominantly occipital	120 (55)
Predominantly cervical	98 (45)

Table 3: Description of pain location during the established headache in comparison to the onset location

Onset Location	Established location	No. of Cases (%)
Unilateral (n = 426)		
Ocular (n = 213)	Stayed same	90 (42.2)
	Hemicranial	92 (43.1)
	Bilateral/Holocranial	31 (14.5)
Frontal (n = 47)	Stayed same	20 (42.5)
	Hemicranial	5 (10.6)
	Bilateral/Holocranial	22 (46.8)
Temporal (n = 166)	Stayed same	91 (54.8)
	Hemicranial	52 (31.3)
	Bilateral/Holocranial	23 (13.8)
Bilateral/Central (n = 226)		
Bilateral Ocular (39)	Stayed same	29 (74.4)
	Holocranial	10 (25.6)
Bifrontal (18)	Stayed same	8 (44.5)
	Holocranial	10 (55.5)
Bitemporal (106)	Stayed same	75 (70.7)
	Holocranial	31 (29.3)
Vertex (63)	Stayed same	21 (33.4)
	Holocranial	32 (50.7)
	Hemicranial	10 (15.9)
Predominantly oc- cipital (n= 120)	Stayed occipital	27 (22.5)
	Holocranial	57 (47.5)
	Hemicranial	21 (17.5)
	Cervicooccipital	15 (12.5)

Table 3: (Continued)

Onset Location	Established location	No. of Cases (%)
(n = 94)	Predominantly cervical	9 (9.5)
	Holocranial	39 (41.4)
	Hemicranial	35 (37.2)
	Cervicooccipital	11 (11.7)

DISCUSSION

This study was conducted on patients having migraine aged over 15 years visiting the Neurology department of our hospital. About 66% of cases belong to the Sindhi ethnic group, whereas 27% of Punjabi and 7% of other ethnic groups were also incorporated. No previous data has been available for the onset and established migraine location. Our study has been the first to study this in the Pakistani population. The present study summarizes the ethnic and demographic features of patients. Identifies the pain location at the onset of migraine and compares the pain location of onset with established migraine. Out of 870 patients, 40.3% were males, and 59.7% were females. It may be the case that women are more prone to get headaches/migraine in these ethnic groups. However, migraine without aura was reported in 81.9% of the population; on the other hand, migraine with aura was reported in 5.1% of individuals. Unilateral onset was noted in 49% of patients, with ocular, frontal, and temporal onsets accounting for 50%, 11%, and 39%, respectively. In 26% of the patients, bilateral/central discomfort, generally bitemporal or at the vertex, was reported. The onset of cervicooccipital pain was noted in 25% of individuals.

Few studies from India have reported the details of migraine locations at onset established acute and chronic migraine. A similar study conducted by Chakravarty et al. (2008) reported Unilateral onset in 41.38% of the patients, with eye pain, frontal pain, and temporal pain accounting for 53.17%, 8.16%, and 38.67%, respectively. Bilateral/central discomfort, primarily bitemporal or at the vertex, was mentioned in 32.25% of the patients. In 26.43% of patients, cervicooccipital discomfort first appeared. The pain continued at the same location in 47.4% of individuals with unilateral ocular or temporal onset. In 32.9% of cases, the pain turned hemicranial. Most patients (55.5%) experienced unilateral frontal beginning pain that progressed to bilateral or holocranial discomfort. Most bilateral ocular (69.4%) and temporal onset (69.7%) pain persisted in the same spot. Most bifrontal (55.6%) and vertex-onset (56.9%) pain, on the other hand, became holocranial. The majority of occipital symptoms progressed to holocranial (45.3%), although cervical pains progressed to either hemi cranial (38.3%) or holocranial (36.2%).¹⁷

Kelman et al. (2005) studied 1283 patients with acute and chronic migraine with medications and observed 63.2% of cases were males, and 67.2% were females; maximum frequency was reported in ocular pain (67.1) followed by temporal pain (58%), frontal pain (55.9%), vertex (24.1%), and diffusely (17.5%). A total of 66% of patients reported hemicranial location, 71.2% had episodic migraine, and 61.4% reported chronic migraine. Migraine with aura was reported in 100%, whereas migraine without aura was reported 68.9% times. Only migraine headaches showed significant changes in headache location; no other migraine types reported the same. The headache location was unrelated to migraine life-time length, triptan reaction, prodrome, severity, recurrence frequency, time to peak of headache, or time to recurrence.¹⁸

The majority of the participants in this study who had cervicooccipital discomfort at the outset had either holocranial or hemicranial headaches afterward. This comorbidity might be the result of genetic and hormonal causes. Functional investigations have added a new dimension to this comorbidity by identifying variations in brain metabolites. There were limitations to the present investigation. There was no random selection of research patients from among all migraine patients. As a result, this study is not generalizable. Patients with chronic migraine and on medication and the subsequent effects were excluded, which could be included in future studies. Similar clinical investigations on the site of migraine pain are planned to be conducted in other geographic locations and ethnic groups to emphasize worldwide heterogeneity in the phenotypic manifestation of this prevalent condition.

CONCLUSIONS

This study inspects the site of pain in migraine patients during the outset and established migraines. More than half of the participants reported discomfort in the cervicooccipital area and bilaterally/centrally.

ACKNOWLEDGEMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed."

Source of funding: None

Conflict of interest: None

Permission: The study was approved by the ethical review committee of the institute

Authors' Contribution: All authors contributed equally towards the data collection, data analysis & compilations

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