

## Impact of Migraine on Symptoms of Fibromyalgia

Babar Ejaz, Fuad Ahmad Siddiqi, Waqar Anwar, Adnan Manzar, Fawad Ahmed, Hassam Abdullah\*

Department of Medicine, Combined Military Hospital Peshawar/National University of Medical Sciences (NUMS) Pakistan, \*Department of Anaesthesiology, Combined Military Hospital Peshawar/National University of Medical Sciences (NUMS) Pakistan

### ABSTRACT

**Objective:** To determine the frequency of fibromyalgia in patients of migraine and to see the impact of migraine on symptoms of fibromyalgia.

**Study Design:** Cross sectional study.

**Place and Duration of Study:** Department of Medicine, Combined Military Hospital, Peshawar Pakistan, from Sep 2023 to Feb 2024.

**Methodology:** The number of patients that were included in the study were 109. Every patient underwent detailed history taking which included information regarding demographic characteristics, clinical characteristics. Diagnosis of fibromyalgia was done with the help of 2016 American College of Rheumatology classification criteria. Headache Impact test-6 was used to assess the impact of headache on patient life. Headache intensity was assessed with the help of visual analogue scale (0-10). FIQR score was used to classify the severity of fibromyalgia.

**Results:** In this study fibromyalgia was diagnosed in 40(36.7%) patients. Duration of migraine, migraine frequency, headache intensity and Headache impact severity score showed significant difference in patients without and without fibromyalgia. Fibromyalgia's assessment was done with the help of FIQR score. The three domains of this score showed that patients experience worsening due to fibromyalgia in terms of function (Median =21), overall impact (Median=13) and symptoms (Median=38.50) and total score (Median=73.50).

**Conclusion:** Results of this study demonstrate high frequency of fibromyalgia in migraine patients. Patients with migraine and fibromyalgia showed higher frequency for migraine attacks and Fibromyalgia impact questionnaire score.

**Keyword:** Aura, Fibromyalgia, Health Impact test, Headache, Migraine, Pain threshold

**How to Cite This Article:** Ejaz B, Siddiqi FA, Anwar W, Manzar A, Fawad Ahmed F, Abdullah H. Impact of Migraine on Symptoms of Fibromyalgia. *Pak Armed Forces Med J* 2024; 74(SUPPL-2): S310-S314. DOI: <https://doi.org/10.51253/pafmj.v74iSUPPL-2.11783>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### INTRODUCTION

Migraine is prevalent condition that impacts significant portion of global population. It is characterized by incapacitating headache attacks which may or may not be associated with preceding aura. It is most likely caused by spreading depolarization, which may also initiate trigeminal sensory activation; fundamental process in driving headaches<sup>1</sup>. There is significant genetic component to migraine vulnerability, according to recent studies. Imbalance in neurotransmitters, especially those involving serotonin, are important in beginning and development of migraines<sup>2</sup>.

Management depends on identification of triggers, which includes hormone fluctuations, chocolate, aged cheese, and processed meats, strong odors, bright lights, and lack of sleep, as well as environmental influences.<sup>3</sup> With development of neuroimaging like PET and functional MRI,

researchers are now able to watch the brain's activity during migraine episode.<sup>4</sup> Acute and preventative methods are used to treat migraines. For immediate relief, triptans are frequently utilised. Furthermore, there is hope for migraine prevention with recent advancements in monoclonal antibody therapeutics that target calcitonin gene-related peptide (CGRP). For mild episodes, management consists of analgesics or NSAIDs; for moderate or severe attacks, triptans or 5HT(1B/1D) receptor agonists are used.<sup>5</sup> Complete migraine management plan frequently include lifestyle modifications.<sup>6</sup>

Worldwide, fibromyalgia affects all populations, with a 2% to 4% prevalence of symptoms in the general population. There is disagreement concerning the disorder's pathophysiology, diagnosis, and course of treatment; some people even deny its existence. The 2016 ACR preliminary diagnosis criteria relied on patient-reported somatic symptoms and cognitive impairments, allowed less severe pain, and excluded tender spots<sup>7</sup>. Although model of pathophysiology of fibromyalgia has been proposed in which biological and psychosocial factors interact to determine the

**Correspondence:** Dr Babar Ejaz, Department of Medicine, Combined Military Hospital Peshawar Pakistan

Received: 11 Mar 2024; revision received: 07 May 2024; accepted: 09 May 2024

propensity, triggering, and worsening of chronic condition<sup>8</sup>. The benefits of multimodal treatments which include both non-pharmacological and specific pharmaceutical interventions aimed at addressing specific symptoms like pain, exhaustion, sleep issues, and mood disorders—are highlighted by the most recent evidence-based guidelines<sup>9</sup>. Most fibromyalgia patients report having headaches, although surveys of fibromyalgia patients have often not been able to determine the nature or importance of headache symptoms in fibromyalgia patients<sup>10</sup>. Most studies did not objectively measure the sample's headache impact and intensity, making it impossible to say if the fibromyalgia patients' headaches were incidental or clinically significant<sup>10</sup>. The objective of the study was to determine the frequency of fibromyalgia in patients of migraine and to see the impact of migraine on symptoms of fibromyalgia.

## METHODOLOGY

This was a cross sectional analytical study conducted at Department of Medicine, Combined Military Hospital, Peshawar. Study duration was from 1st September, 2023 to 29th February, 2024. A total of 109 patients were included in the study as per defined inclusion and exclusion criteria.

**Inclusion Criteria:** Inclusion criteria for patients was diagnosed patients of migraine (as per International Classification of Headache Disorders, 3rd edition (ICHD-3) by a neurologist)<sup>11</sup> aged 23-50 years either gender were included in the study.

**Exclusion Criteria:** Patients with history of diabetes mellitus, patients previously diagnosed with psychiatric/neurological disorder, patients with acute and chronic pain (other than fibromyalgia), patients with substance abuse/addiction were excluded from the study.

Patients selection was done with non-probability purposive sampling technique. Sample size calculation was done with 90% confidence level, 7% absolute precision and by taking expected percentage of fibromyalgia in migraine patients as 27%(10) respectively.

$$n = \frac{z_{1-\alpha/2}^2 P(1-P)}{d^2}$$

Ethical approval was taken from Institutional ethical review board committee with Serial number 66/ 24 dated 1st September, 2023. After obtaining ethical approval 109 patients were included in the

study. Written and verbal informed consent was taken from each patient. The objective of the study was briefly explained to the patients and their attendants. Every patient underwent detailed history taking which included information regarding demographic characteristics (Age, Gender, Martial status, Body mass index), clinical characteristics (accompanying features, presence of fibromyalgia, headache intensity, migraine frequency, migraine severity indices (HIT-6)). Diagnosis of fibromyalgia was done with the help of 2016 American College of Rheumatology classification criteria.<sup>12</sup> Headache Impact test-6 was used to assess the impact of headache on patient life.<sup>13</sup> It consists of 6 questions. The questions were rated on an ordinal scale which ranges between never (6-points), rarely (8-points), sometimes (10-points), very often (11-points) and always (13-points). Each option was had specific point depending on the selection of the patient. The total score for HIT- ranges between 36-78. Scores below 49 indicate minimal to no effect; scores ranging from 50 to 55 indicate a slight impact on one's well-being; scores between 56 and 59 suggest a notable effect; and scores equal to or exceeding 60 signify a significant impairment in the patient's daily functioning due to severe headaches.<sup>13</sup> Headache intensity was assessed with the help of visual analogue scale. The VAS score ranges between 0-10. Where 0 mean no pain and 10 means worst possible pain. Fibromyalgia was assessed with the help of revised Fibromyalgia impact questionnaire. It contains total 21 questions which were subdivided into three main domains (Function= 9 questions (Score: 0-30), Overall impact= 2 questions (Score: 0-30) & Symptoms=10 questions (Score: 0-50)). All questions are based on an ordinal scale with score 0-10. Where 10 shows worst. The total score for FIQR ranges between 0-100.

Statistical package for Social Sciences version 25 was used for data analysis. Mean±SD/ Median(IQR) was used to present quantitative and frequency and percentage was used to present qualitative variables. Chi square test was applied to see association between qualitative variables (Migraine patients with and without fibromyalgia in relation to migraine with aura). Mann Whitney U test was applied to compared duration of migraine, migraine frequency, headache intensity and HIT-6 score in migraine patients with and without fibromyalgia.  $p$ -value<0.05 was considered statistically significant.

## Migraine on Symptoms of Fibromyalgia

**Table-I: Demographic And Disease Related Characteristics Of Patients (n=109)**

Parameters	n(%)
Age (Years)	36.07±7.52 [Minimum=23years, Maximum=50years]
Duration (Years)	7.54±2.48 [Minimum=3years, Maximum=12years]
<b>Gender</b>	
Male	15(13.8%)
Female	94(86.2%)
<b>Marital Status</b>	
Married	53(48.6%)
Unmarried	56(51.4%)
<b>Body Mass Index</b>	
Normal	38(34.9%)
Overweight	39(35.8%)
Obese	32(29.4%)
<b>Fibromyalgia</b>	
Yes	40(36.7%)
No	69(63.3%)
Throbbing Pain	78(71.6%)
<b>Side</b>	
Unilateral	84(77.1%)
Bilateral	25(22.9%)
Vomiting/ Nausea	79(72.5%)
Photophobia/Photophobia	89(81.7%)
Aura	11(10.1%)
Headache Intensity [Median(IQR)]	8.00(2.50)
Migraine frequency (Month)	7.48±1.43
HIT-6 Score [Median(IQR)]	60(13.50)

**Table-II: Headache characteristics among migraine patients with and without Fibromyalgia (n=109)**

	Migraine Patients		p-value
	FM+	FM-	
	40	69	
Duration of Migraine (years) (a)	9.42±1.08	6.44±2.41	<0.001*
Migraine frequency (a)	8.60±1.15	6.84±1.15	<0.001*
Headache Intensity (a) (VAS-Score)	8.22±0.65	6.94±1.60	<0.001*
Migraine with Aura (b)	3(7.5%)	8(11.6%)	0.743
HIT-6 Score (a) [Medina(IQR)]	63(16.75)	57(16)	0.001*

Note: (a): Independent sample t-test/Mann Whitney U Test,

(b): Chi Square test

(\*) Statistically significant p-value<0.05 1'

M+: Fibromyalgia present, FM-: Fibromyalgia absent

## RESULTS

In this study 109 diagnosed patients of migraine were included. Mean age of patients was 36.07±7.52 years. Mean duration of migraine was 7.54±2.48 years respectively. Gender distribution shows female dominance 1:6 ratio. Fibromyalgia was diagnosed in

40(36.7%) patients. Aura was present in 11(10.1%) patients. Throbbing pain was reported by 78(71.6%) patients. Among patients 84(77.1%) reported unilateral and 25(22.9%) reported bilateral pain. Mean score for Head ache intensity was 7.41±1.47 and mean frequency for migraine was 7.48±1.43 respectively. Mean HIT-6 score was

**Table-III: Characteristics of Fibromyalgia Patients**

Parameters	n(%)
<b>Fibromyalgia Assessment (FIQR Score)</b>	
Function [Median (IQR)]	21[3]
Overall Impact [Median (IQR)]	13[4]
Symptoms [Median (IQR)]	38.50[6]
Total Score [Median (IQR)]	73.50[7]
Time since experience Fibromyalgia [Mean±SD]Years	7.72±1.44
Number of Physician Visits per year [Median: Range]	14[7-21]
<b>Number of medications over the past 3 months</b>	
<2 Medications	26(65%)
>2 Medications	14(35%)

## DISCUSSION

Both fibromyalgia and migraine are incapacitating pain conditions, they can worsen each other's morbidity when coexist and have a substantial negative effect on a patient's quality of life.<sup>14</sup> In our study we have studied the frequency of fibromyalgia in migraine patients, and studied the effect of FM on migraine symptoms. Mean age of patients in our study calculated was 36.07±7.52 years. It was noticed in literature that, although migraine can start at any age, but adolescents are typically the first to experience it. In general, migraine peak in 30s and progressively get less severe throughout the succeeding decades. However, in their 50s and 60s, migraines continue to be the most prevalent cause of headaches; however, if a person is 40 years of age or older, they are less likely to experience a new onset migraine.<sup>15</sup>

There were more female patients presented with migraine in our study as compared to males, 86.2% versus 13.8%. It was also documented previously, that the hormonal changes that accompany puberty, rises the prevalence in both sexes; but females are more likely than boys to have it (6.4% versus 4.0%, respectively), and this variation in predominance based on gender persists throughout life.<sup>16</sup> According to the American study, 18% of men and 43% of women have had migraines at some point in their lives.<sup>17</sup>

In our study 35.8% patients were categorized as overweight and 29.4% as obese on the basis of BMI. In fact, many reviews points to a link between obesity and a higher frequency of migraine, obesity results in a 21% increase in migraine diagnoses compared to non-obese.<sup>18</sup>

36.7% patients in our study were diagnosed as having fibromyalgia. In one study, Fibromyalgia has been found as comorbid in 30% migraine sufferer.<sup>19</sup> Central sensitizations has been linked to both chronic migraine and fibromyalgia.<sup>20</sup>

Characteristics of headache among migraine patients with and without Fibromyalgia were compared, found that mean of migraine attacks/month was more among those having FM i.e. FM+: 8.60±1.1 versus FM-: 6.84±1.15,  $p$ -value<0.001. Headache intensity was assessed using VAS 0-10 scale, mean calculated was high for FM+: 8.22±0.65 as compared to FM-: 6.94±1.60,  $p$ -value<0.001. However, frequency of aura noted was less among having fibromyalgia too i.e. FM+: 7.5% versus FM- 11.6%,  $p$ -value: 0.743. HIT-6 Score mean was high among FM+: 63.50±8.68 as compared to FM-: 56.65±8.63,  $p$ -value<0.001. Patients having both FM and migraine reported higher headache intensity, and greater headache-related disability compared to migraine patients without FM. It was also found by another trail that, individuals who have fibromyalgia too along with migraine exhibited much higher headache intensity ratings (OR 1.149,  $p$ -value=.007) and PHQ-9 scores (OR 1.08,  $p$ -value<.0001). Regarding impairment related to migraines, there was no discernible difference,  $p$ -value=0.075. It was documented earlier that, prevalence of migraine among fibromyalgia patients found to be 55.8%, while there was 30% prevalence of fibromyalgia in patients with migraine.<sup>21, 22</sup>

Although there have been occurrences of both, it is unknown if fibromyalgia causes migraines or migraines causes fibromyalgia. Another review found that FM in 30.3% of the patients with migraine. However, unlike our results FM was more common in patients with aura-producing migraines.<sup>23</sup> However, one recent study supported our findings and concluded that patients without aura were found to have FM more frequently than those with aura. In addition to having higher headache frequency ( $p$ -value=0.0002) and intensity ( $p$ -value=0.007), patients with concomitant FM also scored higher on the Headache Impact Test ( $p$ -value=0.0001).<sup>10</sup>

Fibromyalgia's assessment was done with the help of FIQR score. The three domains of this score showed that patients experience worsening due to fibromyalgia in terms of function (Median =21), overall impact (Median=13) and symptoms (Median=38.50) and total score (Median=73.50).

Mean of number of visits to physician clinic calculated was 14 per year. Among 36.7% patients in our study having fibromyalgia, 65% patients were using < 2 medications and 35% on > 2 prescribed drugs. In one study, mean score of total FIQR observed was 52.6. Those age>71 years have maximum disease severity (FIQR 62.14) and between 51-60 years (FIQR 60.31).<sup>24</sup>

This study results were similar to ours and had used same scoring system, however this study was not on patients having migraine. One study found that, most FM flares taken place within 12 hours after a migraine episode. Additionally, the mean monthly number of fibromyalgia flare-ups and the number of rescue drugs used to treat them were considerably lower ( $p$ <0.0001) in patients with migraine prophylaxis but not in those without. In actuality, a successful decrease in the frequency of migraine episodes with a particular prophylactic is accompanied by a decrease in the number of spontaneous flare-ups and induced FMS symptoms.<sup>22</sup> Moreover, one study concluded that in compared to controls without fibromyalgia, patients with comorbid fibromyalgia and migraine report higher levels of depressed symptoms, more intense headaches, and a higher likelihood of severe headache-related disability.<sup>21</sup> Our results were consistent with those reported in previous studies regarding the severity of symptoms; however, we did not investigate depression in our research.

### LIMITATION OF STUDY

Our study has certain limitations, we have not mentioned the treatment strategies patients are adopting and their compliance towards medication was not documented too. Future, research work will be needed to cover this aspect too.

### CONCLUSION

We have found that, 36.7% of patients in our migraine population found to have FM as comorbid. Using FIQR score the patients found to have worsening score in terms of function, overall impact and symptoms respectively. So, migraine patients having FM as comorbidity suffer from more symptoms severity and requiring more visits to physician.

**Conflict of Interest:** None.

**Funding Source:** None.

**Authors' Contribution**

Following authors have made substantial contributions to the manuscript as under:

BE & FAS: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

WA & AM: Data acquisition, data analysis, approval of the final version to be published.

FA & HA: Critical review, concept, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

**REFERENCES**

1. Del Rio MS, Cutrer FM. Pathophysiology of migraine aura. Handbook of Clinical Neurology. 198: Elsevier; 2023. p. 71-83. <https://doi.org/10.1016/B978-0-12-823356-6.00016-0>
2. Hovaguimian A, Roth J. Management of chronic migraine. *bmj*. 2022;379. doi:<https://doi.org/10.1136/bmj-2021-067670>
3. Gazerani P. Migraine and diet. *Nutrients*. 2020; 12(6): 1658. <https://doi.org/10.3390/nu12061658>
4. Ashina S, Bentivegna E, Martelletti P, Eikermann-Haerter K. Structural and functional brain changes in migraine. *Pain and therapy*. 2021; 10: 211-23. <https://doi.org/10.1007/s40122-021-00240-5>
5. Kung D, Rodriguez G, Evans R. Chronic migraine: diagnosis and management. *Neurologic Clinics*. 2023 Feb 1; 41(1): 141-59. doi: 10.1016/j.ncl.2022.05.005.
6. Moon H-S, Park K-Y, Chung J-M, Kim B-K. An Update On Migraine Treatment. *Journal of the Korean Neurological Association*. 2020; 38(2): 100-10. <https://doi.org/10.17340/jkna.2020.2.3>
7. Gur M, Gulkesen A, Akgol G. Comparison of ACR 1990 and ACR 2010 classification criteria in fibromyalgia syndrome. *Med Science*. 2019;8(4):975-9. doi:10.5455/medscience.2019.08.9083
8. Gyorfi M, Rupp A, Abd-Elseyed A. Fibromyalgia pathophysiology. *Biomedicines*. 2022; 10(12): 3070 <https://doi.org/10.3390/biomedicines10123070>
9. Saracoglu I, Akin E, Aydin Dincer GB. Efficacy of adding pain neuroscience education to a multimodal treatment in fibromyalgia: A systematic review and meta-analysis. *International Journal of Rheumatic Diseases*. 2022; 25(4): 394-404. doi: 10.1111/1756-185X.14293.
10. Younis A, Qasem Y, Ali Neamat Sulaiman A. The Frequency of Fibromyalgia in Migraine Patients. *Open Access Macedonian Journal of Medical Sciences*. 2022; 10(B): 260-4. <https://doi.org/10.3889/oamjms>.
11. Arnold M. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. Cephalalgia. 2018; 38(1): 1-211. doi: 10.1177/0333102417738202.
12. Ahmed S, Aggarwal A, Lawrence A. Performance of the American College of Rheumatology 2016 criteria for fibromyalgia in a referral care setting. *Rheumatology international*. 2019; 39(8): 1397-403. <https://doi.org/10.1007/s00296-019-04323-7>
13. Houston MN, Bookbinder HA, Roach SP, Ross JD, Aderman MJ, Peck KY, et al. Reference values for the headache impact test-6 questionnaire. *Archives of physical medicine and rehabilitation*. 2021; 102(12): 2369-76. <https://doi.org/10.1016/j.apmr.2021.05.013>
14. Beyazal MS, Tüfekçi A, Kırbaş S, Topaloğlu MS. The impact of fibromyalgia on disability, anxiety, depression, sleep disturbance, and quality of life in patients with migraine. *Archives of Neuropsychiatry*. 2018 Jun; 55(2): 140. <https://doi.org/10.5152/npa.2016.12691>
15. Hsu Y-W, Liang C-S, Lee J-T, Chu H-T, Lee M-S, Tsai C-L, et al. Associations between migraine occurrence and the effect of aura, age at onset, family history, and sex: A cross-sectional study. *Plos one*. 2020;15(2):e0228284. <https://doi.org/10.1371/journal.pone.0228284>
16. Allais G, Chiarle G, Sinigaglia S, Airola G, Schiapparelli P, Benedetto C. Gender-related differences in migraine. *Neurological Sciences*. 2020; 41: 429-36. <https://doi.org/10.1007/s10072-020-04643-8>
17. Buse DC, Loder EW, Gorman JA, Stewart WF, Reed ML, Fanning KM, et al. Sex differences in the prevalence, symptoms, and associated features of migraine, probable migraine and other severe headache: results of the American Migraine Prevalence and Prevention (AMPP) Study. *Headache*. 2013; 53(8): 1278-99. <https://doi.org/10.1111/head.12150>
18. Hatami M, Soveid N, Lesani A, Djafarian K, Shab-Bidar S. Migraine and obesity: Is there a relationship? A systematic review and meta-analysis of observational studies. *CNS & Neurological Disorders-Drug Targets (Formerly Current Drug Targets-CNS & Neurological Disorders)*. 2021; 20(9): 863-70.
19. Onder H, Hamamci M, Alpua M, Ulusoy EK. Comorbid fibromyalgia in migraine patients: clinical significance and impact on daily life. *Neurological Research*. 2019; 41(10): 909-15.
20. Rehm S, Sachau J, Hellriegel J, Forstenpointner J, Jacobsen HB, Harten P, et al. Pain matters for central sensitization: sensory and psychological parameters in patients with fibromyalgia syndrome. *Pain Reports*. 2021; 6(1): e901. <https://doi.org/10.1097/PR9.0000000000000901>
21. Whealy M, Nanda S, Vincent A, Mandrekar J, Cutrer FM. Fibromyalgia in migraine: a retrospective cohort study. *J Headache Pain*. 2018;19(1): 61. <https://doi.org/10.1186/s10194-018-0892-9>.
22. Giamberardino MA, Affaitati G, Martelletti P, Tana C, Negro A, Lapenna D, et al. Impact of migraine on fibromyalgia symptoms. *J Headache Pain*. 2015; 17: 28. <https://doi.org/10.1186/s10194-016-0619-8>
23. Hansen JM, Charles A. Differences in treatment response between migraine with aura and migraine without aura: lessons from clinical practice and RCTs. *J Headache Pain*. 2019 Sep 6; 20(1): 96. <https://doi.org/10.1186/s10194-019-1046-4>.
24. Di Carlo M, Farah S, Bazzichi L, Atzeni F, Govoni M, Biasi G, et al. AB0716 Fibromyalgia Syndrome Severity According To Age Categories: Results From A National Register. *BMJ Publishing Group Ltd*; 2021. <https://doi.org/10.1136/annrheumdis-2021-eular.1507>