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Migraine in emergency department; a retrospective analysis of the attendances at a major city hospital in Riyadh, Saudi Arabia

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ABSTRACT

Saudi Arabia has the highest rates for migraine, per the Global Summary of the Eastern Mediterranean Region. A recent audit found that 30% of patients with headache-related ED discharge data had been given a migraine diagnosis. For future endeavors to offer alternatives to headache care, it is crucial to understand the features of these emergency migraine attendances. The goal of this study is to describe the characteristics, diagnostic techniques and therapeutic strategies used in migraine patients who sought treatment at King Saud Medical City (KSMC) and security forces hospital in emergency room in Riyadh, Saudi Arabia, during the course of a five-month study period. Migraine C-E criteria according to Headache International Classification were used to categorise adult emergency department headache visits and evaluate attendance characteristics. Because there was inadequate proof of headache symptoms, 221 (24.8%) study participants could not be categorized. 202 (22.6%) of the 670 trial participants who were present experienced headaches or were likely to have migraines based on satisfying criteria C-E of the ICHD-3. The majority of attendances—147 or 72.7%—had symptoms that had lasted more than 24 hours when they came, with 65 attendances (32.1%) happening less than four days following headache onset. A healthcare professional suggested 37 attendances. This analysis reveals how inadequate acute care and a mismatch between migraine diagnosis and coding contribute to under reporting. We advise additional analysis of the identified populations and the usage of headache proforma.

Keywords: Migraine, Emergency department, Headache, Severe headache, Recurrent headache.

1. INTRODUCTION

As a recurrent, chronic, episodic neurological condition, migraine is characterized by a wide range of varying clinical symptoms, such as headache, light sensitivity, dizziness, anxiety, nausea and vomiting (Algahtani et al., 2022; Ashina, 2020). According to World Health Organisation statistics, "migraine" is the third most common pathological ailment in the world, affecting 15% of the world population (Algahtani et al., 2022).

The trigeminovascular system is involved in migraine, which develops as a result of a problem with sensory processing in the brain. The development of this condition is influenced by a variety of genetic and environmental variables. It is classified as the 19th most debilitating disorder in the world (Algahtani et al., 2022; Goadsby et al., 2017; Alkahtani et al., 2022) and has a major impact on quality of life due to functional impairment that necessitates treatment interventions. Patients with comorbidities such diabetes mellitus, hypertension and arthritis had significantly lower (Alkahtani et al., 2022).

Additionally, it was noted that women were more prone to migraines, particularly those under 45 years old; one in five women worldwide experienced migraines, with a female-to-male ratio of 4:1 (Alkahtani et al., 2022; Alsamghan et al., 2020; Al-Rajeh et al., 1990). Compared to the global average, Saudi Arabia has a somewhat greater prevalence of migraines, with a higher rate in the female population. A total of 77.2% of Saudi Arabian adults reported having a headache at some point, with migraines being the most common variety (Al-Ghadeer et al., 2021).

Physiological and psychological participation have a significant impact on the quality of life in migraine patients. Migraine sufferers are less effective and competent in all areas: Academically, socially, professionally, functionally and emotionally. Due to the need for therapeutic services, the financial load is another factor (Al-Ghadeer et al., 2021). The eighth-highest condition to be linked with disability is reportedly migraine, which is likewise related to disability (Al-Ghadeer et al., 2021; Vosoughi et al., 2019).

Numerous risk variables, including anxiety, depression, family history, gender, age, higher academic status, obesity, stress, poor sleep hygiene, eating habits and others (Al-Rajeh et al., 1990; Al-Ghadeer et al., 2021; Sabah et al., 2022), have been linked to migraines and their progressions. Migraine can be brought on by caffeine, alcohol, junk food, irregular sleeping and eating routines, and so forth. Scientific investigations in Saudi Arabia (Alsamghan et al., 2020) also established a connection between migraines and population altitude. 30% of patients with headache-related ED discharge data had been diagnosed with migraine, according to a recent audit (Southwell and Afridi, 2021). Understanding the emergency attendances characteristics for migraine is crucial to better direct future efforts to give alternate access to headache care.

Study aim

Our study aims to describe the characteristics, investigations and treatment used in migraine patients attended emergency department at (KSMC) and security forces hospital in Riyadh Saudi Arabia during the 5-month duration study period.

2. METHOD

The (KSMC) and security forces hospitals are two teaching Hospital in Riyadh, Saudi Arabia, which serves more than a million people and has a major trauma centre and a regional neurosciences institution, participated on the service review with the headache service and emergency department. Patients who visited the ED continuously between 1 December 2022 and 30 April 2023 had their electronic attendance data retrospectively cross-sectionally evaluated. The inclusion criterion was satisfied by all attendances that were noted as being for a headache when the patient arrived.

If clinical data unavailable, a closer examination of the case notes revealed that the patient's primary complaint wasn't a headache or the under 16 patients, attendance was not permitted. The documented headache traits were directly derived from computerized case notes. Regardless of the documented ED doctor diagnosis, patients were classified for assessment if they satisfied criteria C, D and E of (ICHD-3) migraine criteria (Headache Classification Committee of the International Headache Society, 2018; Friedman et al., 2007).

Age, gender, arrival time and arrival manner were the factors identified for headache attendances. For those attendances that satisfied the C-E criteria, the reported diagnosis, discharge code, treatment before and during the attendance, as well as the length of the headache symptom prior to the visit was recorded. Using Microsoft Excel, descriptive statistical analysis was carried out. Research ethical approval was taken from King Saud Medical City Research Center (KSMC) research authority under IRB number (H1RE-25-May23-01).

3. RESULTS

64,923 individuals visited the ED over the course of the 5-month review period and 891 (1.3%) of those visits were categorized as headaches when they arrived. 221 (24.8%) of the study participants could not be classified because there was insufficient evidence of headache symptoms. Of the 670 trial participants who attended, 202 (22.6%) had migraines or probable migraines as determined by satisfying criteria C-E of the ICHD-3.

Despite the fact that a migraine diagnosis was recorded in the clinical documentation for 117 (57.9%) of attendances, ED doctors only assigned a migraine discharge code to 51 (25.2%) of these patients. 62 (30.6%) attendances had scans. 103 (50.9%) of the 202 attendances that met the ICHD-3 C-E criteria for migraine or suspected migraine were discharged with a generic code for headache by ED doctors. Table 1 displays the participant characteristics. And research was done, as in (Table 2).

Table 1 Patients characteristics

Characteristic	All headache patients, *n* = 670, N (%)	Migraine or suspected migraine attendances, *n* = 202, N (%)
Demographics		
Patients age, median (iqr)	37 (28–52)	31 (27–43)
Female	443 (66.1)	152 (75.2)
Mode of arrival		
By ambulance	137 (20.4)	39 (19.3)
Attendance time		
From 7 pm to 6.59 am	214 (31.9)	6 (30.2)1
From 7 am to 6.59 pm	485 (72.3)	139 (68.8)
Weekend	158 (23.5)	58 (28.7)
Not recorded	6 (0.8)	3 (1.4)

Table 2 Investigation

Lab tests, N (%)	All headache patients, *N* = 670	Migraine or suspected migraine attendances, *n* = 202
Attendance scan	161 (24.03)	62 (30.6)
Lumbar puncture	41 (6.1)	8 (3.9)

With 65 attendances (32.1%) occurring less than four days after headache onset, the bulk of attendances—147 or 72.7%—had symptoms that lasted more than 24 hours when they arrived (Table 3). This can be an indication of people who arrived with pre-existing chronic symptoms or migrainosus condition. Of the patients that were seen, 51 (25.2%) do not take migraine medicine at home. Prior to 21 (10.4%) or during 4 (1.9%) attendances, triptan-containing therapy was administered (Table 4) (Figure 1). Arrival technique in 39 (19.3) attendances, patients arrived by ambulance and of those, 14 (6.9%) experienced migraines that started within four days. A health care expert recommended 37 attendances.

Table 3 Migraine duration

Migraine/probable migraine attendances		
Duration of headache before attendance	Number	Percentage
Up to 1 day	55	27.23
2 days	26	12.87
3 days	24	11.88
4 days	21	10.4
5–9 days	41	20.3
10–14 days	5	2.475
>14 days	19	9.406
Not recorded	11	5.446

Table 4 Patient's treatment

Treatment before patient attendance	Number	Percentage
Triptan	21	10.4
Use of simple analgesia	98	48.51
Not used any treatment	71	35.15
Opiates	12	5.941
Treatment given during attendance		0
Triptan	4	1.98
Only use simple analgesia and antiemetic	83	41.09
No treatment used	51	25.25
Opiates	54	26.73

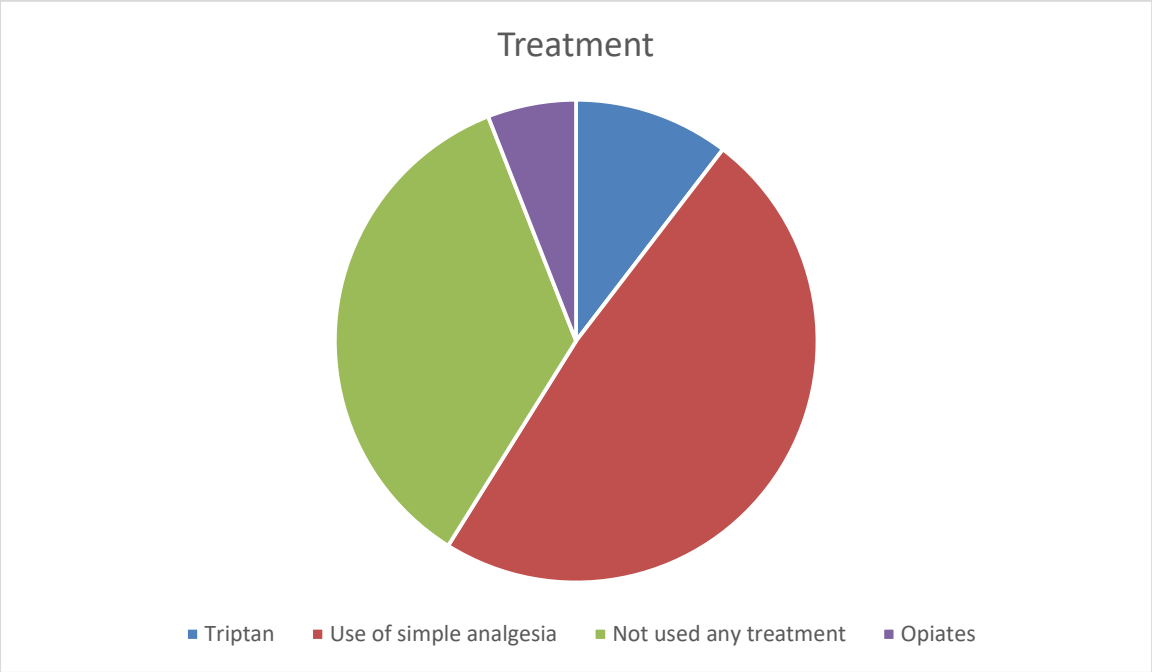

Figure 1 Treatment used

4. DISCUSSION

The ICHD-3 categories C-E for migraine or suspected migraine were identified as important patient groups accessing the ED in this service assessment. The bulk of those who visit the emergency room with a migraine do so sub acutely; 32% do so within four days of start. These delayed attendances may point to issues with main or specialty care access and warrant further study. Surprisingly, a one third of patients did not take analgesics before to attendance (Goadsby et al., 2008), despite encouragement to do so early, highlighting the need of patient and clinician education.

Last but not least, multiple patients with migraines were sent to the ER by ambulance, although only one of them had a prescription. This could demonstrate how important and urgent they view their needs as being. Health economic analyses have not taken into account the utilization of ambulances, which has led to increase in recognized direct costs of migraine (Osumili et al., 2018). More research is needed on these cohorts. According to a recent study, migraine was coded for one-third of the patients who went to the emergency room with headaches (Southwell and Afridi, 2021).

However, by using documented symptoms, we were able to identify evaluation participants with reported migraine features satisfying the ICHD-3 criteria C-E for migraine/probable migraine. The recorded diagnoses and coding information from ED doctors was then compared to this data. Despite the fact that the causes are unknown, inconsistent coding is known to under report a variety of ailments in the emergency department. Retrospective note reviews utilizing features with documentation have been employed in the past (Friedman et al., 2009) but are constrained by insufficient documentation.

While accurate records of medicine intake and start of symptoms were supplied by the ED documentation, headache characteristics were less frequently reported. This study has consequences for how migraine attendances are evaluated using only ED coding data. We propose that a method based on standardized proformas would enhance ED diagnosis and management. Data quality would be improved by providing ED doctors with coding support, enabling more precise assessment of the degree of common migraine symptoms presenting to emergency services.

5. CONCLUSION

Priority categories for additional research include those with non-acute presentations, those who did not use analgesics before to attendance and those transported in an emergency. It is necessary to place more emphasis on nontraditional forms of support, migraine management education and community-based self-management guidance. A proforma-based method of evaluating ED headaches might help junior medical colleagues speed up appropriate diagnosis. The accuracy of reporting headache conditions will increase with coding support for ED providers.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Authors' contribution

Osama Mohammed BinbAlamri: Supervision all the step of the research from the idea until the submission
Wael Obaid Aladham Alanazi: Participated in writing the discussion and conclusion
Hend Hamoud Alshammari: Participated in writing the discussion and conclusion
Abdelwahed Sayar Alenezy: Participated in writing the discussion and conclusion
Abdulaziz Abdullah Mohammed Hussain: Participated in writing results and data analysis
Ammar Ahmad Hassan Alasiri: Participated in writing results and data analysis
Fahad Awad Asiri: Participated in writing results and data analysis
Sarah Ahmed Alghamdi: Participated in writing introduction
Farah Ahmed Alghamdi: Participated in writing introduction
Hashim Marshud R Alsaedi: Participated in writing introduction
Fahad Hadram AlAsemr Alharbi: Participated in collecting literature
Rayan Dhaif Allah A Alamri: Participated in collecting literature

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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