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## OBJECTIVES

- To characterize referral patterns and healthcare resource utilization in patients with headache disorders in the United Kingdom

## CONCLUSIONS

- Primary care resource utilization was higher amongst patients with headache disorders, who visit the GP at more than twice the rate of those without headaches
- The average time to specialist referral was 2.1 years, with most referrals directed to neurologists
- These findings highlight that patients with headache disorders experience prolonged delays before accessing specialist care despite substantial primary care utilization
- Understanding current healthcare utilization and referral patterns may help optimize care and strengthen service infrastructure for patients with headache disorders

## ACKNOWLEDGMENTS

This real-world study was funded by Organon. P.C., and R.I. are employees of Organon. Editorial and medical writing support under the guidance of the authors was provided by Indegene, Bengaluru, India, and was funded by Organon, Jersey City, NJ, USA, in accordance with Good Publication Practice (GPP) guidelines. Contact Paula Chu at paula.chu@organon.com with questions or comments.

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## INTRODUCTION

- Headache disorders, including migraine, are common neurological conditions that significantly impact quality of life, causing pain and disability, and often require medical intervention<sup>1,2</sup>
- Most headache care should be initiated and managed in primary care, with certain cases necessitating a specialist<sup>3</sup>
- A large survey across 5 European countries reported that many patients with chronic migraine were not referred to specialists despite being inadequately managed in primary care<sup>4</sup>

- Real-world evidence on referral patterns for inadequately controlled headache disorders in primary care is limited
- The purpose of this study was to address this gap by evaluating referral patterns among patients with headache disorders

## METHODS

### Study Design

- A retrospective descriptive analysis using anonymized electronic health records from The Health Improvement Network (THIN) database in the United Kingdom was performed during December 1, 2016 to April 28, 2024
- Index date was defined as the date of first headache-specific general practitioner (GP) visit
- The follow-up period extended from the index date until either the end of the study period or the last observable headache-specific data entry (whichever occurred first)
- Patients with a diagnosis of headache disorders (cohort 1) were matched 1:1 with patients without a history of headache disorders (control: cohort 2) based on sex, care site, and year of birth (+/- 2 years) to compare outcomes

### Participants

- British adults (≥18 years) registered in the THIN database with a GP diagnosis of headache disorder (International Classification of Diseases-10: migraine [G43] and other headaches [G44, R51]), and had ≥1-year of follow-up were included

### Study Measures

- Number of GP visits after index date
- Referral patterns among patients with headache disorders after index date
- Duration between the diagnoses or index date and the first referral of patients with headache disorders
- Demographic and clinical characteristics of patients with headache disorders

## RESULTS

- Overall, 103,300 patients with headache disorders were identified and matched with a control
- Mean age at diagnosis was 43.3 years and majority of patients with headache disorders were female (75.5%; **Table 1**)

**Table 1. Patients' Characteristics**

Characteristics	Cohort 1 (N = 103,300)	Cohort 2 (Control; N = 103,300)
<b>Age at Index date or diagnosis (years)</b>	43.3 ± 16.7	–
18–29	25,673 (24.9)	–
30–39	23,850 (23.1)	–
40–49	19,415 (18.8)	–
50–59	15,574 (15.1)	–
60–69	9627 (9.3)	–
≥70	9161 (8.9)	–
<b>Gender</b>		
Male	25,321 (24.5)	25,321 (24.5)
Female	77,979 (75.5)	77,979 (75.5)

Data reported as n (%) or mean ± standard deviation.

- Patients with headache had more than double the number of annual all-cause visits to the GP than controls (mean ± SD: 4.1 ± 3.3 versus 1.4 ± 1.5)
- The duration of the first referral from the index date was on average about 2.1 years (769.2 days)
- Overall, 64.4% of patients with headache were referred to any specialized care after diagnosis (**Table 2**)
- The most referrals by specialty were to neurology (7.8%), followed by orthopedics (7.1%) and surgery (6.8%; **Figure 1**)

**Table 2. Number of GP Visits and Referral Patterns**

Outcome Variable	Cohort 1 (N = 44,615)	Cohort 2 (Control; N = 44,615)
<b>Number of GP visits after index date</b>		
Number of GP visits (headache disorder related)	2.3 ± 2.5	–
Number of GP visits (all-cause)	19.6 ± 18.0	6.8 ± 8.2
Annualized GP visits (all-cause)	4.1 ± 3.3	1.4 ± 1.5
<b>Referral patterns in patients with headache disorder in primary care treatment after index date</b>		
Time to first referral (days)	769.2 ± 638.8	–
Referral to any specialized care	66,478 (64.4)	32,840 (31.8)
Referral to neurological specialized care	12,231 (11.8)	1,101 (1.1)
Number of specialist referrals	4.5 ± 4.7	2.9 ± 2.9
Annualized specialist referrals	1.0 ± 1.0	0.6 ± 0.6

Data reported as n (%) or mean ± standard deviation. GP, general practitioner.

**Figure 1. Distribution of First Referral Specialty Among Patients With Headache Disorders**

