A Retrospective Cohort Study of Urgent Care Visits and Revisits for Headache/Migraine

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Abstract

Objective. Increasingly, patients are seeking same-day care at urgent care (UC) facilities. Little is known about the health care utilization patterns of patients who visit UC facilities for headache and migraine. We examined the frequency of headache and migraine visits and revisits at UC facilities. **Methods.** We conducted a retrospective cohort study of headache not otherwise specified (NOS) and migraine visits from 67 NYC UC facilities over an eight-month period. We report descriptive analyses, the frequency of headache NOS revisits, and the elapsed time to revisits. **Results.** There were 10,240 patients who visited UC facilities for headache NOS or migraine within the eight-month period. The majority of patients, 6,994 (68.3%), were female, and the mean age (SD) was 35.1 (15.0) years. Most (93.9%) patients (N = 9,613) lived within 60 miles of NYC; 5.5% (N = 564) had at least one revisit, and among revisitors, there was an average (SD) of 2.2 (0.7) visits to UC facilities during the study period and an average time to revisit (SD) of 61.3 (55.2) days. **Conclusions.** In just eight months, there were >10,000 headache NOS and migraine visits to UC facilities in NYC, with half of revisits occurring within 90 days. Future work should examine headache management in UC facilities.

Key Words: Urgent Care Visits; Headache; Migraine; Revisits; Acute Care

Introduction

Over 36 million Americans suffer with migraine, the second most disabling condition in disability-adjusted life-years [1]. There is a continuing need for access to timely and appropriate migraine care. Oftentimes, patients with migraine will visit the emergency department (ED) for care, but the ED is a suboptimal place to receive care for migraine [2] because of long wait times to be seen [3], the presence of loud noises and bright lights (both of which are often exceedingly unpleasant for patients with an acute migraine), and the frequent use in the ED of unnecessary tests and opioids [4]. Moreover, about two-thirds of patients report persistent or recurrent headache within 24 hours of ED discharge, attesting to the difficulty that

emergency physicians may have in providing adequate headache and migraine treatment [5]. Specialty headache care with a headache specialist or a neurologist may be helpful, but access is often limited—there is an average wait time of up to 15 months to see a headache specialist in the United States [6].

Over the past 20 years, more than 9,000 urgent care (UC) facilities have opened across the country, offering unscheduled, same-day appointments [7]. This growth is due to the “consumer demand for convenient access to care” [8]. Given their ability to expand access to care and given the variety of services they provide, UC facilities are well situated to provide timely migraine care. Furthermore, UC facilities can save costs by reducing

nonurgent ED visits without a concomitant increase in hospitalizations [9]. UC facilities may often be the most appropriate place to seek medical treatment [10].

Little has been published about the health care utilization of those who visit UC facilities for headache. To date, only one study has been published on UC facilities and migraine management. In this single academic medical center study consisting of two UC sites, the researchers found that there were 78 patients diagnosed with migraine over a three-year period [11]. Exploring health care utilization rates of those who visit urgent care centers for headache or migraine will provide the foundation for developing additional research into ensuring quality headache care in urgent care centers. Thus, we conducted a database analysis to determine the UC visit and revisit rates and the time frame of these revisits for patients with headache.

Methods

This is a retrospective cohort study using a database of NYC UC facilities. This study was deemed exempt by the Institutional Review Board (IRB) of New York University Langone Health.

Study Setting and Population

Through a partnership with CityMD and other UC facilities in New York City, the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) monitors UC facility visits to detect disease outbreaks. The NYC DOHMH collects data from UC facilities throughout all five boroughs of NYC. All patient information is de-identified. For this analysis, the NYC DOHMH created a data set of all patients who visited one of the 67 UC facilities with a mention of headache or migraine as the chief complaint or *International Classification of Diseases–10* (ICD-10) discharge diagnosis codes for headache (R51 | G44) and migraine (G43) between January 1, 2018, and February 28, 2019. Thus, we included patients who had a “headache” as part of a constellation of other symptoms due a nonprimary headache cause/a secondary cause. Those with “migraine” could also be analyzed separately. We were able to track patient care visits within urgent care systems.

Outcome

The primary outcome of this study was the number of UC facility visits and revisits for migraine or headache NOS. The secondary outcome was the time to revisit for headache NOS diagnosis within the six-month period after the initial UC facility visit. Any subsequent visit to a UC facility for headache NOS or migraine within six months of the index visit was considered a revisit. In prior ED studies, patients who revisit have been described as “early” and “late” return patients [12]. The early return patients often come back because they failed

a reasonable trial of treatment (“expected”) or because they had a problem with the discharge process or outpatient treatment plan (“unexpected”). The “late” return patients revisit for reasons that are either related or unrelated to prior visits [13]. For the purpose of this study, we reviewed the six months following the index visit.

Because many migraine visits are categorized as headache NOS [14] and because migraine is the most common primary headache disorder seen in the ED, we included in the analysis revisits for headache NOS. This was done to increase sensitivity at the risk of lowering the specificity for migraine. For the purposes of this analysis, headache is considered to be a nonmigraine headache. We looked at the top ICD-10 code single discharge diagnoses for these visits. We also determined the number of headache NOS or migraine revisits within six months and the elapsed time (in days) to repeat visit.

Predictor Variables

We report basic descriptive demographic statistics, including age, sex, and whether they were residents of NYC. We also assessed whether age or sex was associated with UC revisits.

Data Availability

Anonymized data will be shared by request from any qualified investigator, in accordance with institutional and NYC DOHMH policies.

Data Analyses

The data were analyzed using SPSS, version 25. We report frequency of visits, revisits, and number of revisits made by each individual using descriptive statistics. We also report the frequencies of revisits within 24 hours, 72 hours, 30 days, 90 days, and six months. Mean age, number of visits among all patients and revisitors, and interval time to revisits are reported as mean with standard deviation. Using multivariable logistic regression, we assessed whether there was an association between age and sex and revisit for headache. In this model, all predictor variables were included and maintained in the model. We also created a Kaplan-Meier curve of time to revisit.

Results

There were 10,240 unique patients with an index visit to a NYC UC facility for a chief complaint of headache NOS or migraine during the first eight months of 2018. In this sample, 5.5% (N = 564) of patients had at least one headache NOS or migraine revisit to a UC facility. There were 689 (6.3%) revisits during our study period, with nine revisits happening on the same day and 680 revisits happening on subsequent days. As shown in Table 1, 68.3% (N = 6,994) of our patients were female. One patient had an unspecified sex. The mean age at the

Table 1. Patient demographics

Participants, No.	10,240
Age, mean $\pm$ SD [IQR], y	35.1 $\pm$ 15.0 [34.8–35.4]
Female, No. (%)	6,994 (68.3)
NYC residents, No. (%)	9,275 (90.6)
Patients with at least 1 revisit, No. (%)	564 (5.5)
Patients with revisits on the same day, No.	9
Mean number of visits per <i>all</i> patients $\pm$ SD [IQR]	1.1 $\pm$ 0.3 [1.06–1.07]
Mean number of visits per patients who revisited $\pm$ SD [IQR]	2.22 $\pm$ 0.668 [2.17–2.28]
Mean interval between index visit and second revisit $\pm$ SD [IQR], d	61.3 $\pm$ 55.2 [56.7–65.8]

IQR = interquartile range.

Table 2. Concordance of chief complaints and diagnoses at index visit

Concordance of Chief Complaints and Diagnoses at Index Visit				
	Headache Diagnosis, No. (%)		Migraine Diagnosis, No. (%)	
Headache chief complaint (N = 7,889)	3,671 (46.5)		385 (4.9)	
Migraine chief complaint (N = 1,061)	239 (22.5)		583 (54.9)	
Chief Complaints and Diagnoses by Sex on Index Visit ^{*,†}				
Sex	Headache Chief Complaint, No. (%)	Migraine Chief Complaint, No. (%)	Headache Diagnosis, No. (%)	Migraine Diagnosis, No. (%)
Female (N = 6,994)	4,980 (71.2)	721 (10.3)	3,613 (51.7)	789 (11.3)
Male (N = 3,245)	2,506 (77.2)	171 (5.3)	1,770 (54.5)	172 (5.3)

*Out of the nine participants who revisited urgent care on the same day, there is no way to discern which visit was the index visit. However, with the exception of one patient, all of them had the same chief complaint and diagnosis on the same-day revisit.

†The one patient with unspecified sex was excluded.

index visit (SD) was 35.1 (15.0) years, with a median age (interquartile range [IQR]) of 32 (25–44) years. The majority of patients, 9,613 (93.9%), had a ZIP code within 60 miles of NYC, and 9,285 (90.6%) were NYC residents. Among the patients who revisited, the mean number of visits to UC facilities (SD) was 2.2 (0.7) times, with a median (IQR) of 2.0 (2–2). Patients who revisited waited an average (SD) of 61.3 (55.2) days from the index visit to the revisit. [Table 2](#) depicts the frequency of headache NOS and migraine chief complaints and diagnoses among males and females. The one headache NOS visit with unspecified sex was excluded from this analysis.

[Table 3](#) shows the most frequent ICD-10 code single diagnoses that were documented among our patient population. The most common cause of secondary headache was associated with acute sinusitis (3.4%), followed by viral infection (2.5%) and cough (2.2%).

Out of all headache chief complaint visits to UC facilities (N = 7,889), 46.5% received a headache NOS diagnosis and 4.9% received a migraine diagnosis. In the 1,061 patients with a chief complaint of migraine, 54.9% received a concordant migraine diagnosis, whereas 22.5% received a headache NOS diagnosis upon discharge. At the index visit, patients who revisited a UC facility subsequently were more likely to have a migraine chief complaint (19.1%) than patients who only visited once (8.1%, $P < 0.0001$). Similarly, those who revisited

had a higher frequency of migraine diagnosis (22.0%) compared with those who did not revisit (8.7%, $P < 0.0001$). [Table 4](#) shows the frequency of headache and migraine chief complaints and diagnoses among the index visits vs the revisits.

[Table 5](#) depicts the frequency of revisits for headache NOS or migraine within 24 hours, 72 hours, 30 days, 90 days, and 180 days. Among those who revisited, the median number of days to revisit between the index visit and first revisit (IQR) was 50.0 (7.0–101.75). The majority of revisits (64.3%) happened within 90 days of the index visit. [Figure 1](#) shows a Kaplan-Meier curve of time to revisit among those who revisited. On multivariable analysis, there was no association between age (odds ratio [OR] = 0.999, 95% confidence interval [CI] = 0.994–1.005, $P = 0.857$) or sex (OR = 1.141, 95% CI = 0.946–1.375, $P = 0.168$) and revisit for headache NOS.

Discussion

In this retrospective analysis of a large NYC database, we noted several key findings [1]: Within a large metropolitan city, there were many visits to UC facilities for headache NOS and migraine [2]. A minority of patients (5.5%) revisited a UC facility for headache NOS or migraine within a six-month period; among those patients who did revisit, the majority of revisits (64.3%) happened within 90 days of the index visit [3]. The frequency of migraine chief complaints and diagnoses among those

Table 3. Top 20 ICD-10 diagnoses among patients who presented to urgent care with headache or migraine

ICD-9 Code	Frequency, No. (%)	Diagnosis
R51	4,973 (48.6)	Headache
G43.909	889 (8.7)	Migraine, unspecified, not intractable, without status migrainous
J01.90	349 (3.4)	Acute sinusitis, unspecified
B34.9	258 (2.5)	Viral infection, unspecified
R05	224 (2.2)	Cough
G44.209	207 (2.0)	Tension-type headache, unspecified, not intractable
R11.0	205 (2.0)	Nausea
R68.89	164 (1.6)	Other general symptoms and signs
J10.1	153 (1.5)	Influenza due to other identified influenza virus with other respiratory manifestations
J06.9	139 (1.4)	Acute upper respiratory infection, unspecified
R42	126 (1.2)	Dizziness and giddiness
S09.90XA	114 (1.1)	Unspecified injury of head, initial encounter
J02.9	100 (1.0)	Acute pharyngitis, unspecified
I10	92 (0.9)	Essential (primary) hypertension
R09.81	73 (0.7)	Nasal congestion
J02.0	61 (0.6)	Streptococcal pharyngitis
H66.90	56 (0.5)	Otitis media, unspecified, unspecified ear
J11.1	46 (0.4)	Influenza due to unidentified influenza virus with other respiratory manifestations
R53.83	38 (0.4)	Other fatigue
R50.9	37 (0.4)	Fever, unspecified
M62.838	37 (0.4)	Other muscle spasm

ICD = *International Classification of Diseases*.

*These do not include patients discharged with multiple diagnoses that could have included headache (R51 | G44) or migraine (G43).

Table 4. Chief complaint and diagnoses at index visit based on patients who revisited urgent care within six months of index visit

	Patients Who Only Visited Once, No. (%)	Patients Who Revisited, No. (%)
Total	9,676	564
Chief complaint		
Headache	7,121 (73.6)	366 (64.9)
Migraine	784 (8.1)	108 (19.1)
Diagnosis		
Headache	5,111 (52.8)	272 (48.2)
Migraine	837 (8.7)	124 (22.0)

Table 5. Elapsed time between index visit and frequency of revisits

Revisit Time Frame After Index Visit	Frequency of Urgent Care Revisits (N = 689 Revisits), No. (%)
Within 24 h	38 (5.5)
Between 24 and 72 h	59 (8.6)
Between 72 h and 30 d	153 (22.2)
Between 30 and 90 d	193 (28.0)
Between 90 and 180 d	246 (35.7)

who revisited was substantially higher than headache chief complaints and diagnoses.

There were over 10,000 patient visits for headache NOS or migraine to a subset of UC facilities in New York City. This is not surprising given that patients with headache and migraine often cannot access typical outpatient care in a timely manner. Patients with headache typically present to an acute care setting because the headache is perceived as an emergency condition, because they were referred by an MD or had difficulty accessing care because the clinic or doctor's office was closed, or because they could not get an appointment soon enough or had nowhere else to go [2]. The hours in which a UC facility is open are typically greater than regular outpatient office visit hours, with the vast majority open in the evenings and a significant minority open on weekends [15]. Thus, patients with headache or migraine have more opportunity to be evaluated and treated in a timely manner outside of traditional hours without going to the ED. With the significant expansion of hours of operation beyond typical office hours, UC facilities may be a better option for acute management of patients with migraine who cannot get an immediate appointment in an outpatient setting and do not need to go to the ED. It is important to note that the database used did not include information about recent ED visits, meaning that we do not know if patients who presented at UC facilities also presented at an ED before or after their initial UC visit.

Only a small percentage (5.5%) of the sample revisited UC facilities for headache NOS or migraine within six months of their index visit. In comparison, in NYC, about one-quarter of ED patients with migraine revisit the same ED for headache at least once within a six-month period, and 12.5% revisited the same ED for headache one or more times [12]. In Maine, revisit rates were 30.3% [16]. The lower UC revisit rate may be due to 1) population differences: UC patients may have better insurance [15], and thus they may have better access to outpatient headache care as well. UC facilities are located in neighborhoods with higher income levels. 2) There are intrinsic differences in migraine characteristics in the patient population visiting UC facilities compared with that of EDs. Research shows that UC facilities primarily provide care for simple, acute problems rather than complex chronic conditions [8]. The people visiting the UC facilities for headache or migraine may be going for reasons that are relatively straightforward to treat, and thus do not need to pay a revisit. In comparison, the revisit rate in patients with headache NOS or migraine in the ED may be higher because patients may require a higher complexity level of care and/or may be more refractory to treatment. 3) Higher patient satisfaction with urgent care facilities compared with EDs and higher patient satisfaction in general have been associated with lower hospital readmission rates upon discharge [17,18]. 4) The amount of time spent with a provider may be longer in UC facilities (a UC physician sees on average 65.4 patients each week [15]); thus, there may be more time

Figure 1. Kaplan-Meier curve of time to urgent care facility revisit among those who revisited urgent care for headache or migraine.

with patients to ensure adequate diagnosis, management, and a follow-up plan.

Among the patients who did revisit UC facilities, the frequencies of migraine chief complaints and diagnoses were much higher compared with patients with a headache chief complaint or headache NOS diagnosis who only visited once during the study period. This is likely due to the high disability associated with migraine and the fact that migraine is a chronic condition with acute attacks. Even though the revisit rate seems to be lower in UC facilities compared with the ED, there is still an opportunity to optimize management of migraine in this setting.

Future Work in Urgent Care

UC facilities could play an important role in the management of patients with migraine. Currently, regulation or standardization of these UC facilities varies significantly across states, as most states are first trying to define “urgent care” given the broad scope of practice that can fall under the UC name [19]. As patients with migraine are both visiting and revisiting UC facilities to seek treatment, standardized protocols might be developed to try to optimize migraine care. There may be opportunities for headache specialists and neurologists to go to the UC societies to educate UC physicians and advanced practice providers on headache and migraine treatment. In terms of targeting the specific providers who are most likely to come work in a UC facility, research has shown that most facilities (95.8%) have physicians on staff, and family medicine is the most common specialty (present at about three-quarters of the centers) [15]. Other specialties sometimes staffing them include emergency medicine, internal medicine, and pediatrics. About half also have advanced practice providers (NPs and PAs). Thus, there is a continuing need for headache education among

primary care and emergency physicians, physician assistants, and nurse practitioners, the types of providers most likely to staff a UC. Given its population prevalence and associated disability, headache is inadequately covered in both emergency medicine and primary care residency curricula. Postresidency, management of headache should be a frequent topic of grand rounds and conference-based educational programs.

In addition, there has been a move toward UC facilities partnering with academic health care systems as a way of bringing in more patients to the health care systems. This has occurred throughout New York City [20,21] but also across the country [22]. These numerous partnerships between UC facilities and big academic health systems can lend themselves to not only UC facilities referring patients appropriate for specialist care, but to partnerships in which neurologists and headache specialists use these UC facilities to provide acute care, for example, infusion treatments for their headache patients, rather than setting up headache-specific infusion centers that might require significant staffing and/or sending their patients to the ED for such care. This might reduce headache ED repeat visits, which have been found to be predominately due to headache-related acute care [23]. In addition, whereas a prior study found that a substantial number of headache specialists were dissatisfied with the care their patients receive in the ED, in part because they felt that there was little communication between the ED physicians and the primary headache providers [24], such partnerships between UC facilities and neurologists/headache specialists might improve communication between providers in these different settings.

Strengths

This study has several strengths. It uses a large data set from one of the largest cities in the United States, New

York City. We were able to examine revisits up to six months after the initial UC facility visit. We were also able to track patient care visits at more than one UC facility.

Limitations

This study has several limitations. First, the study population was limited to NYC, and we do not know the locations of the UC facilities within NYC. It is known that there are disparities in the choice of location in many UC facilities. They tend not to be in rural areas or in lower-income areas/areas with low concentrations of privately insured patients [25,26]. Second, the data set only included limited information on patient demographics. Third, the “index” visit may not have necessarily been the first visit for migraine. The same patients could have visited UC facilities before the study start date. Thus, it is possible that some index visits were actually revisits. Fourth, diagnoses were determined by UC providers and were probably not based on the International Classification of Headache Disorders (ICHD)–3 criteria. Fifth, we do not know how headache and migraine were specifically managed in the UC facilities; that is, we do not know which medications were administered, which prescriptions were provided, or whether follow-up instructions were given upon discharge.

Conclusions

In conclusion, >10,000 people visited a subset of UC facilities for headache or migraine in NYC within an eight-month period. Revisit rates were low, with just 5.5% of patients with migraine still revisiting UC facilities within a six-month period. The majority (64.3%) of revisits occurred within 90 days of the index visit. Given that there are a substantial number of visits, future work might target how patients are being treated for headache or migraine in this rapidly emerging medical setting and whether partnerships might be made between UC facilities and neurologists to ensure that patients can get easily accessible, efficient quality care for their headache or migraine. In other words, this study provides the background for a more comprehensive, prospective, and multicenter study that 1) characterizes the type of headache disorders that the patient population presents with, 2) leads to the creation and study of headache care protocols for UC providers, 3) assesses the impact on patient outcomes, and 4) explores further the partnerships with academic health systems for proper follow-up after UC discharge.

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