

# Real World Analysis of Health Plan Medical and Pharmacy Claims Data to Assess Differences in Healthcare Utilization and Total Cost in Patients Suffering from Cluster Headaches Compared with Patients without Headache-Related Conditions

M. Polson, T. C. Lord, T. Evangelatos  
Magellan Rx Management, Newport, RI

AMCP Nexus 2016 | National Harbor, MD

## Purpose

- Assess differences in healthcare utilization and total cost in patients suffering from cluster headaches (CH) compared with patients without headache-related conditions.

## Background

- According to the WHO, headache disorders are underappreciated by many health systems.
- These disorders have a substantial impact on quality of life.
- The true correlation between headache conditions and increased total healthcare utilization is not well understood.
- This study further explores the impact of headache conditions on healthcare utilization.

## Methods

- Medical and pharmacy claims data from 4 regional health plans were used to evaluate differences in healthcare utilization and cost in patients with a CH diagnosis (chronic, episodic, or unspecified) compared to a control group of patients without headache-related condition.
- Qualifying patients were  $\geq 18$  years old and continuously eligible for three consecutive years during the study period (1/1/2009-12/31/2015).
- The first date with a diagnosis of CH was considered the index date and the subsequent three years of claims data was used for this retrospective analysis.
- The CH cohort was matched with controls using propensity score matching.
- Differences between cohorts (CH vs. control) were assessed via *t*-test or Fisher's Exact Test as appropriate.

## Disclosures

- This research was conducted by Magellan Rx Management, Newport, RI, with external funding by electroCore LLC.

## Results

- A total of 4,174 patients with CH met the study criteria and were matched 1:1 with controls. For the cluster headache population:
  - Gender: 48% male
  - Mean Age: 47
  - Mean Charlson Comorbidity Index: 0.30
- Mean overall medical costs per patient in CH cohort were \$25,805 vs. \$10,140 for the control group.
- A higher number of patients with CH use medical services across almost all categories compared to the control group.
- Mean pharmacy costs per patient in CH cohort were more than double than the control group: \$9,197 vs \$4,368, respectively.

## Demographics

|                                   | Cluster Headaches |                     |                     |                     | Control             |                     |
|-----------------------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                                   | Chronic           | Episodic            | Not Defined         | Total               | Control             |                     |
| <b>Patient Count</b>              | 724               | 751                 | 2,699               | 4,174               | 4,174               |                     |
| <b>Gender</b>                     | F                 | 368 (4.4%)          | 365 (4.4%)          | 1,427 (17.1%)       | 2,160 (25.9%)       | 2,160 (25.9%)       |
|                                   | M                 | 356 (4.3%)          | 386 (4.6%)          | 1,272 (15.2%)       | 2,014 (24.1%)       | 2,014 (24.1%)       |
| <b>Age Group</b>                  | 18-39             | 192 (2.3%)          | 226 (2.7%)          | 818 (9.8%)          | 1,236 (14.8%)       | 1,236 (14.8%)       |
|                                   | 40-54             | 291 (3.5%)          | 272 (3.3%)          | 1,087 (13.0%)       | 1,650 (19.8%)       | 1,650 (19.8%)       |
|                                   | 30-39             | 146 (1.7%)          | 151 (1.8%)          | 481 (5.8%)          | 778 (9.3%)          | 778 (9.3%)          |
|                                   | 55-64             | 95 (1.1%)           | 102 (1.2%)          | 313 (3.7%)          | 510 (6.1%)          | 510 (6.1%)          |
|                                   | 65+               | 192 (2.3%)          | 226 (2.7%)          | 818 (9.8%)          | 1,236 (14.8%)       | 1,236 (14.8%)       |
| <b>Charlson Comorbidity Index</b> | Continuous        | 0.31 $\pm$ 0.83 [0] | 0.30 $\pm$ 0.88 [0] | 0.30 $\pm$ 0.82 [0] | 0.30 $\pm$ 0.83 [0] | 0.30 $\pm$ 0.83 [0] |
|                                   | 0                 | 592 (7.1%)          | 626 (7.5%)          | 2,211 (26.5%)       | 3,429 (41.1%)       | 3,429 (41.1%)       |
|                                   | 1                 | 83 (1.0%)           | 71 (0.9%)           | 311 (3.7%)          | 465 (5.6%)          | 465 (5.6%)          |
|                                   | 2+                | 49 (0.6%)           | 54 (0.6%)           | 177 (2.1%)          | 280 (3.4%)          | 280 (3.4%)          |

Continuous data: mean  $\pm$  standard deviation [median]. Discrete data: count (percent)

## Medical Costs

|   | Cluster Headaches            |                              |                              |                              | Control                      | P-value* |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|----------|
|   | Chronic                      | Episodic                     | Not Defined                  | Total                        | Control                      |          |
| <b>Overall Medical Cost per Patient</b>         | 30,502 $\pm$ 50,131 [15,091] | 22,607 $\pm$ 39,721 [12,158] | 25,436 $\pm$ 45,851 [11,553] | 25,805 $\pm$ 45,650 [12,225] | 10,140 $\pm$ 39,412 [3,383]  | < 0.01   |
| <b>Patient Counts by Medical Service Type</b>   |                              |                              |                              |                              |                              |          |
| <b>Diagnostic Testing</b>                       | 697 (8.3%)                   | 715 (8.6%)                   | 2,583 (30.9%)                | 3,995 (47.9%)                | 3,231 (38.7%)                | < 0.01   |
| <b>Emergency Department</b>                     | 361 (4.3%)                   | 366 (4.4%)                   | 1,424 (17.1%)                | 2,151 (25.8%)                | 962 (11.5%)                  | < 0.01   |
| <b>Home Infusion/Specialty Rx</b>               | 191 (2.3%)                   | 148 (1.8%)                   | 478 (5.7%)                   | 817 (9.8%)                   | 427 (5.1%)                   | < 0.01   |
| <b>Hospital Inpatient</b>                       | 175 (2.1%)                   | 160 (1.9%)                   | 565 (6.8%)                   | 900 (10.8%)                  | 253 (3.0%)                   | < 0.01   |
| <b>Hospital Outpatient</b>                      | 609 (7.3%)                   | 599 (7.2%)                   | 2,214 (26.5%)                | 3,422 (41.0%)                | 2,141 (25.6%)                | < 0.01   |
| <b>Physician Office</b>                         | 716 (8.6%)                   | 748 (9.0%)                   | 2,649 (31.7%)                | 4,113 (49.3%)                | 4,089 (49.0%)                | 0.79     |
| <b>Cost per Patient by Medical Service Type</b> |                              |                              |                              |                              |                              |          |
| <b>Diagnostic Testing</b>                       | 4,332 $\pm$ 6,133 [2,446]    | 3,524 $\pm$ 4,434 [1,973]    | 3,822 $\pm$ 5,305 [2,065]    | 3,857 $\pm$ 5,321 [2,105]    | 1,515 $\pm$ 3,160 [549]      | < 0.01   |
| <b>Emergency Department</b>                     | 2,106 $\pm$ 8,091 [853]      | 1,509 $\pm$ 2,074 [851]      | 2,078 $\pm$ 4,635 [896]      | 1,986 $\pm$ 5,095 [870]      | 1,268 $\pm$ 2,044 [802]      | < 0.01   |
| <b>Home Infusion/Specialty Rx</b>               | 4,162 $\pm$ 27,345 [700]     | 6,245 $\pm$ 53,046 [495]     | 4,910 $\pm$ 47,087 [545]     | 4,977 $\pm$ 44,470 [557]     | 1,730 $\pm$ 8,450 [170]      | < 0.01   |
| <b>Hospital Inpatient</b>                       | 8,105 $\pm$ 24,429 [3,784]   | 6,621 $\pm$ 9,062 [3,117]    | 7,261 $\pm$ 15,455 [3,431]   | 7,312 $\pm$ 16,736 [3,443]   | 8,528 $\pm$ 45,509 [6,768]   | 0.68     |
| <b>Hospital Outpatient</b>                      | 14,965 $\pm$ 32,281 [5,018]  | 10,277 $\pm$ 18,780 [3,215]  | 12,360 $\pm$ 24,639 [4,339]  | 12,459 $\pm$ 25,328 [4,312]  | 7,644 $\pm$ 45,146 [1,506]   | < 0.01   |
| <b>Physician Office</b>                         | 8,740 $\pm$ 14,147 [4,970]   | 6,924 $\pm$ 10,631 [4,077]   | 7,139 $\pm$ 14,527 [4,043]   | 7,379 $\pm$ 13,843 [4,181]   | 3,672 $\pm$ 9,495.08 [1,742] | < 0.01   |

## Pharmacy Costs

|   | Cluster Headaches           |                            |                            |                            | Control                  | P-value* |
|---|-----------------------------|----------------------------|----------------------------|----------------------------|--------------------------|----------|
|   | Chronic                     | Episodic                   | Not Defined                | Total                      | Control                  |          |
| <b>Overall Prescription Fills per Patient</b> | 30.66 $\pm$ 23.23 [25]      | 23.90 $\pm$ 19.09 [19]     | 24.79 $\pm$ 20.74 [19]     | 25.66 $\pm$ 21.04 [20]     | 12.34 $\pm$ 11.33 [9]    | < 0.01   |
| <b>Overall Prescription Cost per Patient</b>  | 12,534 $\pm$ 21,528 [5,497] | 8,209 $\pm$ 17,353 [3,095] | 8,570 $\pm$ 19,913 [2,477] | 9,197 $\pm$ 19,839 [2,947] | 4,368 $\pm$ 13,379 [891] | < 0.01   |
| <b>Patient Counts by Rx Type</b>              |                             |                            |                            |                            |                          |          |
| <b>Analgesics</b>                             | 477 (5.7%)                  | 451 (5.4%)                 | 1,734 (20.8%)              | 2,662 (31.9%)              | 1,017 (12.2%)            | < 0.01   |
| <b>Triptans - Oral</b>                        | 205 (2.5%)                  | 180 (2.2%)                 | 667 (8.0%)                 | 1,052 (12.6%)              | 35 (0.4%)                | < 0.01   |
| <b>Triptans - SubQ</b>                        | 92 (1.1%)                   | 95 (1.1%)                  | 172 (2.1%)                 | 359 (4.3%)                 | 3 (0.0%)                 | < 0.01   |
| <b>Opiates - All</b>                          | 411 (4.9%)                  | 369 (4.4%)                 | 1,471 (17.6%)              | 2,251 (27.0%)              | 968 (11.6%)              | < 0.01   |
| <b>Opiates - Associated with an ED Visit</b>  | 94 (1.1%)                   | 103 (1.2%)                 | 382 (4.6%)                 | 579 (6.9%)                 | 125 (1.5%)               | < 0.01   |
| <b>Verapamil</b>                              | 148 (1.8%)                  | 145 (1.7%)                 | 324 (3.9%)                 | 617 (7.4%)                 | 25 (0.3%)                | < 0.01   |
| <b>Lithium</b>                                | 31 (0.4%)                   | 16 (0.2%)                  | 43 (0.5%)                  | 90 (1.1%)                  | 9 (0.1%)                 | < 0.01   |
| <b>Valproic Acid</b>                          | 54 (0.6%)                   | 26 (0.3%)                  | 111 (1.3%)                 | 191 (2.3%)                 | 15 (0.2%)                | < 0.01   |

\* Cluster headache total versus control.

## Conclusion

- This analysis shows that CH patients utilize healthcare resources at a higher rate and cost the healthcare system more than similar patients without headache-related conditions.