Poster #31

Characteristics of persons with hemophilia A treated with emicizumab with or without factor VIII inhibitors

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Summary

Hemophilia A (HA) is a bleeding disorder in which blood does not clot normally, due to a deficiency in factor VIII.[1]

Persons with hemophilia A (PwHA) are prescribed prophylactic treatment, taken to prevent a bleed from occurring, or treatment to take on demand when needed.

Emicizumab is approved for prophylaxis in PwHA with and without factor VIII inhibitors and of all ages.[2]

The results presented here show that in the real-world setting emicizumab is used in PwHA with a broad range of characteristics and across various age groups.

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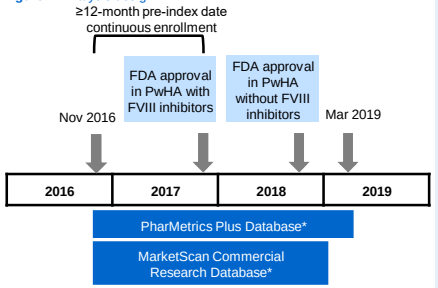
Introduction

- HA is caused by a deficiency in coagulation factor (F) VIII activity and is characterized by spontaneous or traumatic bleeding.[1]
- PwHA are prescribed coagulation factor treatment to take on demand for bleeding and some patients are additionally prescribed prophylactic treatment, which is taken to prevent a bleed from occurring.
- Around 30% of persons with severe HA develop inhibitors against FVIII replacement, making treatment ineffective and leaving these people with few treatment options.[3]
- Emicizumab is a novel treatment for PwHA that replaces the function of missing activated factor VIII (FVIIIa).[4,5]
- It was first approved in the United States for prophylaxis in PwHA with FVIII inhibitors in 2017, with the label broadened to include those without FVIII inhibitors in 2018.[2]
- Real-world data can provide valuable information regarding the clinical characteristics of the types of individuals prescribed emicizumab, and allow evaluation of the effect of FVIII inhibitor status on disease burden.
- This study presented here aims to provide an early view of individuals treated with emicizumab, according to FVIII inhibitor status.

Methods

This retrospective analysis used data from US commercial insurance claims (Figure 1).

Figure 1. Analysis design.



Inclusion criteria
- PwHA with evidence of emicizumab use (≥1 emicizumab claim).†
- ≥12 months of continuous enrollment prior to the index date‡ (i.e. the year prior to taking emicizumab).

*Both PharMetrics Plus Database and MarketScan Commercial Research Database were utilized, therefore it is possible that there was some duplication across databases. †Emicizumab claims were identified using National Drug Code [NDC] or Healthcare Common Procedure Coding System [HCPCS] codes [Q9995]. ‡The index date was the date of first emicizumab claim. It was adjusted to an earlier date during the study period, if emicizumab use prior to the specific NDC or Q-code claim was identified through an appropriate miscellaneous claim or unclassified drug or biologic HCPCS J-code.
FDA, US Food and Drug Administration; FVIII, factor VIII; PwHA, persons with hemophilia A.

Outcomes

- Individual information and disease characteristics (such as major bleeds, arthropathy, and pain), use of FVIII and bypassing agents (BPAs), and healthcare resource use were examined in the 12-month period before first use of emicizumab.
- An algorithm developed by Shrestha et al. (2017)[6] was used to identify major bleeds, defined as a cluster of bleeding claims for the same body part in a 7-day period; arthropathy and pain were identified using International Classification of Diseases Ninth and Tenth Revisions Clinical Modification (ICD-9-CM/ICD-10-CM) diagnosis codes.
- National Drug Codes or Healthcare Common Procedure Coding System codes were used to identify FVIII and BPAs.

Results

Among 107 individuals identified, those with FVIII inhibitors were younger, and a larger proportion had major bleeds, pain, and arthropathy than those without FVIII inhibitors (Table 1).

Table 1. Individual and disease characteristics before starting emicizumab.

	PwHA with FVIII inhibitors *n* = 18	PwHA without FVIII inhibitors *n* = 89	All PwHA *N* = 107
Male, *n* (%)	18 (100)	89 (100)	107 (100)
Coverage with a Preferred Provider Organization plan, *n* (%)	15 (83)	62 (70)	77 (72)
Age			
Mean (±SD), years	18.0±13.3	25.4±18.2	24.1±17.6
Range, years	3–51	1–62	1–62
≤5 years, *n* (%)	4 (22.2)	14 (15.7)	18 (16.8)
Major bleed in the year before taking emicizumab, *n* (%)	8 (44)	22 (25)	30 (28)
Bleeds in those with ≥1 major bleed			
Mean (±SD)	3.1±2.4	1.9±1.6	2.2±1.9
Range	1–8	1–7	1–8
Arthropathy or related disorder	8 (44)	10 (11)	18 (17)
Hemophilic arthropathy	5 (28)	3 (3)	8 (7)
Comorbidities, *n* (%)			
HIV/AIDS	0 (0)	11 (12)	11 (10)
Hepatitis C	0 (0)	1 (1)	1 (1)
Depression/anxiety	1 (6)	5 (6)	6 (6)
Obesity	1 (6)	0 (0)	1 (1)
Pain	8 (44)	5 (6)	13 (12)

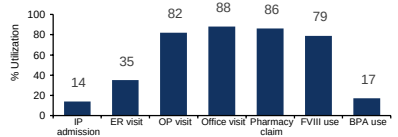
AIDS, acquired immune deficiency syndrome; FVIII, factor VIII; HIV, human immunodeficiency virus; PwHA, persons with hemophilia A; SD, standard deviation.

In the 12 months prior to taking emicizumab, the mean (± standard deviation [SD]) number of office visits was 8.0 (±9.7).

- The mean (±SD) number of emergency room visits was 0.7±1.4.
- The mean (±SD) number of outpatient visits was 4.1±9.7 and inpatient stays was 0.2±0.6; mean length of inpatient stay was 1.1±3.5 days.
- The mean (±SD) number of FVIII and BPA prescriptions were 10.3±12.3 and 8.6±7.9, respectively.

The majority of persons with HA had made outpatient and office visits, pharmacy claims and had evidence of FVIII use (Figure 2).

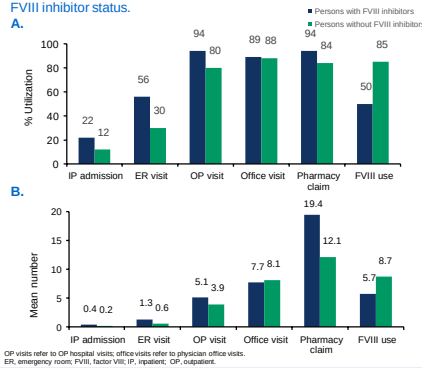
Figure 2. Healthcare resource utilization in the year prior to taking emicizumab (*N* = 107).



OP visits refer to OP hospital visits; office visits refer to physician office visits.
BPA, bypassing agent; ER, emergency room; FVIII, factor VIII; IP, inpatient; OP, outpatient.

In general, persons with FVIII inhibitors had higher healthcare resource use in the year prior to taking emicizumab than those without FVIII inhibitors (Figure 3A and B).

Figure 3. Percentage of persons utilizing healthcare resources (A) and number of visits and claims (B) in the year prior to taking emicizumab by FVIII inhibitor status.



OP visits refer to OP hospital visits; office visits refer to physician office visits.
ER, emergency room; FVIII, factor VIII; IP, inpatient; OP, outpatient.

Conclusions

- To our knowledge, this is the first real-world claims study that describes the characteristics of individuals prescribed emicizumab.
- Results show utilization of emicizumab in persons with HA with a broad range of clinical characteristics, and across various age groups.
- Persons with HA with FVIII inhibitors had greater disease burden and higher healthcare resource use in the year prior to taking emicizumab than those without FVIII inhibitors.
- Longer follow-up data will enable further examination of these real-world outcomes.

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References
1. Mannucci PM, Tuddenham EG. *N Engl J Med* 2001;344:1773–9; 2. HEMLIBRA® prescribing information. 2018. https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/761090s000lbl.pdf [accessed July 2020]; 3. Witmer C, et al. *Ther Adv Hematol* 2013;4:59–72; 4. Kitazawa T, et al. *Nat Med* 2012;18:1570–4; 5. Sampei Z, et al. *PLoS One* 2013;8:e57479; 6. Shrestha A, et al. *Haemophilia* 2017;23:e267–75.

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Disclosures
AM: Consultant role with Genentech, Inc., speakers' bureau with Alexion, Genentech, Inc., and Spark Therapeutics; **EY:** Employment with Genentech, Inc.; **AMP:** Employment and shareholder of stock with F. Hoffmann-La Roche Ltd./Genentech, Inc.; **RK:** Employment with Genentech, Inc.; **KR:** Employment with Genentech, Inc.; **CSM:** Employment with Genentech, Inc.; **IIA:** Employment with Genentech, Inc.