Spinal Muscular Atrophy: An Integrated Medical and Pharmacy Claims Analysis of Nusinersen (Spinraza®) Uptake and Gene Therapy Forecast Among 15 Million Commercially Insured

C. I. Starner[1,2], P. P. Gleason[1,2]. [1]Prime Therapeutics LLC, Eagan, MN, United States; [2]University of Minnesota College of Pharmacy, Minneapolis, MN, United States.

No external funding provided for this research

Background

- Nusinersen (Spinraza®) is a survival motor neuron-2 (SMN2)-directed antisense oligonucleotide indicated for spinal muscular atrophy (SMA) in pediatric and adult patients.[1]
- Nusinersen launched in January 2017 with an annual first-year cost of $700,000. Using integrated real world medical and pharmacy claims data prior to nusinersen launch, Prime Therapeutics, a PBM serving over 15 million commercially insured lives, forecasted a per member per month (PMPM) potential financial impact of $0.15 to $0.40.[2]
- Nusinersen is administered via intrathecal injection with four loading doses (day 0, day 14, day 28, and day 63) and every four months thereafter.
- Onasemnogene abeparvovec (Zolgensma®), is a proprietary gene therapy currently in development, and it has been granted Orphan Drug Designation for the treatment of all types of SMA, Breakthrough Therapy Designation, as well as Fast Track Designation, for the treatment of SMA Type 1 — one of the most life-threatening neurological genetic disorders.[3,4]
- According to the Institute for Clinical and Economic Review (ICER), nusinersen is most cost effective when used in patients with presymptomatic SMA, and the annual price would need to be under $65,000 (90 percent reduction) to meet a $150,000 per quality-adjusted life year (QALY) threshold. For onasemnogene abeparvovec, the price to meet a $150,000 QALY threshold is $900,000.[4]
- Health insurers need to understand the potential financial impact of existing and new-to-market SMA therapy.

Objectives

- Use integrated medical and pharmacy claims data to describe nusinersen utilization and expenditures over time among commercially insured members.
- Forecast the potential uptake of onasemnogene abeparvovec gene therapy for SMA using medical claims data.

4085-D © Prime Therapeutics LLC 03/19
2900 Ames Crossing Road, Eagan, MN 55121
AMCP, March 2019, San Diego, CA, USA
Catherine Starner, 800.858.0723, ext. 5073
cstarner@primetherapeutics.com

Methods

Nusinersen Trend

- Integrated medical and pharmacy claims data among approximately 15 million commercial insured members were queried from January 2017 through September 2018.
- Commercial medical claims were queried for:
  1) Healthcare Common Procedure Codes (HCPC) C9489 or J2326
  2) Drug name Spinraza or nusinersen
  3) National drug code for nusinersen
- Pharmacy claims were queried for:
  1) Nusinersen generic product identifier
- Total paid amounts (plan plus member) were summed quarterly and divided by average membership to calculate total paid per member per month (PMPM) and examine nusinersen trend post launch.

Nusinersen Utilization, Spend and Total Cost of Care

- Commercial medical claims were queried for ICD10 codes including G12.0 Infantile spinal muscular atrophy, type I [Werdnig-Hoffman], G12.1 Other inherited spinal muscular atrophy, G12.8 Other spinal muscular atrophies and related syndromes, or G12.9 Spinal muscular atrophy, unspecified in any of the five ICD10 code fields at any time from January 2017 through September 2018. The diagnoses were not limited to those found on the same claim as nusinersen.
- Members with a medical or pharmacy claim for nusinersen between January 2017 and December 2017 were identified. A member's earliest nusinersen claim was their index claim.
- Members were required to be continuously enrolled nine months (post period) following their index nusinersen claim. All members were new to nusinersen therapy.
- Based on prescribing information, in a nine-month period and starting with the first dose, a member following prescribing directions would have five nusinersen claims. The first three doses in month one, the fourth dose in month three and the fifth dose in month seven.
- We describe the percentage of members with: expected number or one dose less than expected, two to three doses less, and four or more doses less than expected.
- All medical and pharmacy claims allowed amounts (plan paid plus member paid) were summed to calculate total cost of care in the post period and the percentage of total cost of care made up by nusinersen. The manufacturer provided no rebates or discounts to the pharmacy benefit manager (PBM) or the health insurer.

Gene Therapy Forecast One Year Post Launch

- To forecast uptake of the new gene therapy, we limited the members with any of the four different SMA diagnoses to those with:
  1) One or more diagnosis code SMA Type 1 (G12.0) in any field
  2) A primary field G12.0 diagnosis code
  3) Two or more SMA Type 1 (G12.0) diagnosis codes found in the primary field in their medical claims at least 30 days apart
- Members were further limited to less than three years of age because studies have been limited to SMA Type 1, the youngest and most severe population with average life expectancy less than two years.
- The forecast is independent of previous nusinersen utilization.
- We assumed 50 percent of potentially eligible members would receive the one-time gene therapy.
- The forecast used a wholesale acquisition cost (WAC) of $4.5 million and is reported as total paid PMPM, across all 15 million commercially insured lives.

Results

- Among 15 million commercially insured members, from January 2017 to September 2018, 973 members (6 per 100,000) had one or more SMA diagnosis codes and the most common was SMA unspecified (47 percent) **(Figure 1).**

Nusinersen (Spinraza®) Utilization, Dosing, and Cost from Launch to October 2018

- Nusinersen total paid PMPM was $0.15 in 2017, and increased to $0.23 PMPM in the first nine months of 2018 **(Figure 2).**
- Nusinersen total paid PMPM increased 84 percent over the 21-month period, from $0.03 PMPM in February 2017, to $0.19 PMPM in September 2018.
- 55 members had a nusinersen medical or pharmacy claim in 2017, and 49 members were continuously enrolled nine months after their index claim **(Table 1).**
  - The average age of nusinersen users was 13 years, median age was 10 years, and ranged from less than one year to 63 years.
  - 17 members had a primary field SMA type 1 diagnosis code (average age 7 years); 28 had G12.1 Other inherited spinal muscular atrophy (average age 16). One member with only nusinersen pharmacy claims did not have any medical claims. Three members with an average age of 26 years had G12.9 Spinal muscular atrophy, unspecified medical claims.
  - Average total paid for nusinersen in the 9-month follow up was $644,600, with a median of $576,718.
  - 56 percent received the expected number of doses or one less than expected; 40 percent received two or three doses less than expected, and 2 percent only received one dose of nusinersen in a 9-month follow-up period.
  - Total cost of care was an average of $753,483 per member and nusinersen accounted for 86 percent of the total cost of care **(Table 2).**

2019 Forecast for Onasemnogene Abeparvovec (Zolgensma) SMA Gene Therapy (Table 3)

- If 50 percent of the 17 members identified with two primary field SMA Type 1 diagnoses who are under three years old receive gene therapy in 2019 at $4.5 million, the potential net new spend is $0.20 PMPM.

Figure 1. Spinal Muscular Atrophy (SMA) Member Identification and Nusinersen (Spinraza®) Utilization

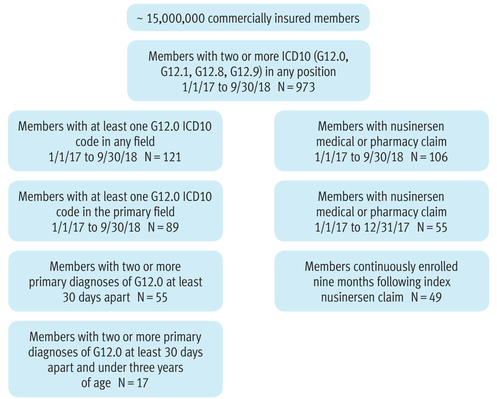

Figure 2. Integrated Medical and Pharmacy Nusinersen (Spinraza®) Total Paid Per Member Per Month 1Q2017 through 3Q2018

Limitations

- Administrative pharmacy and medical claims have the potential to be miscoded and include assumptions of members' actual drug use and diagnoses.
- The data used in this study was limited to a commercial population and results are not generalizable to Medicare or Medicaid populations.
- Nusinersen was approved for SMA in February 2017. Future analyses could find a higher percentage of members using nusinersen for SMA.
- Nusinersen reported dosing assumes all nusinersen dosing events are being billed to insurer and patient is not receiving free-care nusinersen, which is unlikely as these individuals were continuously eligible for commercial health insurance during their 9-month follow-up.
- Forecasting assumes all members with SMA type 1 are coded with G12.0, however the most commonly used code in our data is G12.9, unspecified. If G12.9 code was indicated, this would result in a higher PMPM forecast for the new gene therapy.
- Onasemnogene abeparvovec (Zolgensma) SMA gene therapy forecast assumes treatment will be limited to the population studied for approval, that is, less than three years of age.

Table 1. Member Distribution by Number of Nusinersen (Spinraza®) Doses Compared to Prescribing Information Over 9 Months

Nusinersen doses received over 9 months follow-up*	Members N = 49
Expected number or 1 dose less	56% (28)
2 to 3 doses less	40% (20)
4 or more doses less	2% (1)

*Members expected to receive five nusinersen doses in a 9-month period.

Table 2. Total cost of Care among 49 Commercially Insured Continuously Enrolled Members Using Nusinersen (Spinraza®) Over 9 Months

49 Spinraza® utilizers	Pharmacy	Medical	Overall
Nusinersen claims	31	159	190
Nusinersen total paid	$4,071,755	$27,513,645	$31,585,400
Other total paid	$25,050	$5,310,226	$5,335,276
Overall total paid	$4,096,805	$32,823,871	$36,920,676
Nusinersen total paid per member per month			$0.26
Nusinersen % of total cost of care			86%
Average total cost per member in 9 months follow up			$753,483 Range: $140,403 to $3,768,870

Table 3. Forecast for New Gene Therapy onasemnogene abeparvovec* (Zolgensma) Based on Different Diagnosis Code Requirements and Age

Diagnosis code rules	Members	PMPM if 50% of eligible members receive $4.5 million gene therapy
Members with at least one diagnosis code G12.0 in any field	121	$1.50 (60 members treated)
Members with at least one diagnosis code G12.0 in the primary field	89	$1.10 (44 members treated)
Members with G12.0 2 codes at least 30 days apart in primary position	55	$0.68 (27 members treated)
Members with G12.0 2 codes at least 30 days apart in primary position and under 3 years of age	17	$0.20 (8 members treated)

*onasemnogene abeparvovec was granted Orphan Drug Designation for the treatment of all types of spinal muscular atrophy (SMA) and Breakthrough Therapy Designation, as well as Fast Track Designation, for the treatment of SMA Type 1

PMPM = per member per month

Conclusions

- SMA medical claim diagnosis was rare in this commercial population at 6 per 100,000 and despite nusinersen (Spinraza®) being used by less than 1 per 100,000 commercial members, nusinersen contributed to PMPM trend, $0.23 PMPM in the first nine months of 2018.
- As 4 in 10 individuals initiating nusinersen received 2 to 3 doses less than recommended during nine months of follow up, the potential for a persistency outcome-based contract with the manufacturer exists. Patients starting on therapy and not persisting beyond a few months represent therapy failures with substantial drug cost and little to no clinical value.
- Clinical programs, such as utilization management, combined with other strategies to ensure appropriate use and billing should be employed for expensive specialty products, like nusinersen, because of the high price to value.[4]
- A new SMA gene therapy could have a large impact on trend for plans in 2019 and beyond, with forecasted PMPM increase from $0.20 to $1.50, especially as the indication expands to all SMA types.
- Specialty drug forecasting is required to inform health insurers of potential utilization and financial impacts and to proactively develop managed care clinical programs integrated across pharmacy and medical benefits.

References

1. Spinraza® (nusinersen) [package insert]. Cambridge, MA 02142: Biogen; 2016–2018.
2. Prime Therapeutics, LLC. Internal data, 2017.
3. Pagliarulo N. Available at: https://www.biopharmadive.com/news/gene-therapy-could-be-cost-effective-in-sma-but-not-at-4m/544969/ Accessed on February 18, 2019.
4. Spinraza® and Zolgensma® for Spinal Muscular Atrophy: Effectiveness and Value. Evidence Report from the Institute for Clinical and Economic Review. February 22, 2019.

030087A1