Projected benefits of gout control on the health and economic burden of CKD patients with uncontrolled gout

FR-PO921

Brad A Marder (a), Joshua Card-Gowers (b), Lise Retat (b), Marek Piotrowski (b), Laura Webber (b), Brian LaMoreaux (a), Ada Kumar (a)

Introduction

- Gout affects 1 in 4 patients with stage 3-5 CKD and is an independent risk factor for CKD progression.[1]
- Urate lowering therapies (ULTs) cannot manage gout in some CKD patients.[2] This study examined potential benefits of serum urate (SU) lowering with pegloticase in CKD patients with refractory gout.

Objective

- To quantify the potential health and economic benefits of controlling gout by lowering SU in refractory uncontrolled gout patients in the US CKD population between 2023 and 2035.

Methods

A validated microsimulation model[3] was adapted and used to project the burden of gout in a virtual CKD population and project the benefits of managing uncontrolled gout with pegloticase in virtual patients that are non-responsive to or cannot tolerate oral ULT.

- Individuals in the model were assigned an eGFR, albuminuria status, and SU level.
- Those with gout were assigned complication (stroke, type 2 diabetes (T2D), hypertension) risks, direct and indirect costs, ULT treatment probability, and utility weight.
- In the intervention scenario, patients with uncontrolled gout (SU >6 mg/dL despite oral ULT use, and ≥2 gout flares/year or ≥1 tophus) were "treated" with pegloticase, assuming sustained SU <6 mg/dL through simulation end in 71% of patients.[4]
- Health and economic benefits were projected through 2035 and compared to the baseline (oral ULT use without pegloticase) scenario.

Baseline Results

- The prevalence of CKD in the US is projected to increase by 17.1% between 2023 and 2035, with stage 3-5 CKD increasing by 35.8%.
- The number of people living with comorbid gout and CKD was projected to increase by 21.8%, from 7.9M (2.7M with uncontrolled gout) in 2023 to 9.6M (3.3M with uncontrolled gout) by 2035.
- 2.7M virtual CKD patients with gout were expected to have tophi by 2035.
- The direct healthcare costs of gout in the CKD population were projected to reach $47.3B by 2035, a 21.8% increase from 2023.

Intervention Results

- Under the pegloticase intervention scenario, 353,000 more gout cases were controlled, and 264,000 fewer patients had tophi, by 2035, compared to the baseline scenario **(Fig. 1)**.
- Uncontrolled gout cases reduced by 10.8% in the first year.
- With SU control, 3.7M gout flares were avoided through 2035.
- Over 50,000 SU-related complications (type 2 diabetes, hypertension, and stroke) were avoided through 2035 (**Fig. 2**).
- In the CKD and uncontrolled gout group, $27.8B was saved cumulatively through 2035 (annual average of $2.1B; **Fig. 3**)
- The scenario resulted in 7.7M working days gained, and 273,000 quality-adjusted life years gained through 2035.

Figure 1. Projected change in tophaceous gout cases

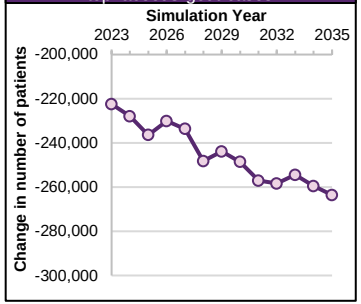


Figure 2. Cumulative difference in complication incidence through the persistent intensive urate-lowering intervention scenario relative to the baseline scenario, 2023 to 2035

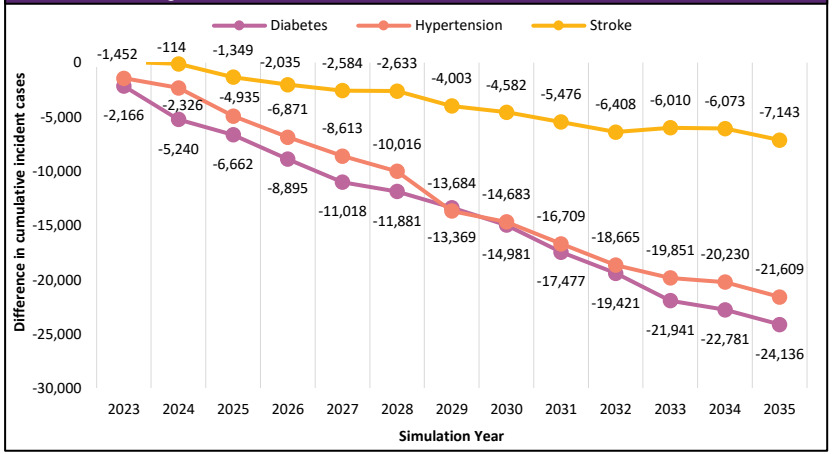
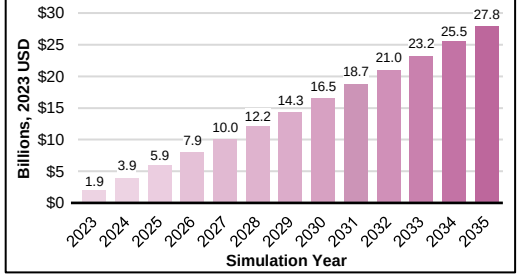


Figure 3. Estimated cumulative cost savings with SU-lowering intervention for uncontrolled gout through 2035



Conclusion

- The prevalence of gout in CKD patients is projected to markedly increase over the next 12 years.
- This microsimulation suggests that successful treat-to-target urate-lowering could result in health, economic, and quality of life improvements for gout patients.

Poster presented at the 2023 annual meeting of the American Society of Nephrology, November 2-5 (Philadelphia, PA)

References: [1] Krishnan E, et al. *PLoS One* 2012;7:e50046. [2] Peng YL, et al. *Sci Rep* 2020;10:10734 (2020) [3] Tangri N, et al. *Adv Ther* 2022;1-17. [4] Botson J, et al. *Arithritis Rheumatol* 2023;75:293-304. **Contact**: For additional information, please contact Joshua Card-Gowers: joshua.card-gowers@healthlumen.com

Affiliations: a) Horizon Therapeutics plc, Deerfield, Illinois, United States; b) HealthLumen Ltd, London, United Kingdom

Disclosures: JCG, LW, LR, and MP are employees of HealthLumen, who was contracted by Horizon for forecasting expertise. BL, BM, and AK are employees of and stockholders in Horizon. This research was funded by Horizon.