A Claims Analysis to Characterize All-cause Mortality in Patients with Generalized Pustular Psoriasis in the United States

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Aims: This study compared all-cause mortality rates among patients with GPP to matched populations of patients with plaque psoriasis (PsO) and to the general population in the US

Background

- Generalized pustular psoriasis (GPP) is a chronic, heterogeneous, neutrophilic skin disease characterized by recurring flares of widespread erythema, oedema, coalescing pustules, and possible systemic symptoms. [1,2]
- GPP has a distinct ICD-10 code (L40.1) compared to plaque psoriasis (PsO) with ICD-10 code corresponding to L40.0.
- GPP flares are associated with painful skin lesions often requiring hospitalization, which can negatively impact the quality of life.[2] There are limited data to describe the mortality burden of GPP in the United States (US).
- Although an initial study reported a GPP mortality rate of 32%, recent research reported lower mortality rates ranging from 2% to 7%, likely due to the availability of novel therapies.[3]
- Frequently-reported causes of mortality in GPP include sepsis, acute respiratory distress syndrome, and heart failure.[4-8]
- Literature describing the mortality burden of GPP in the US is limited which is essential for developing effective treatments to address both morbidity and mortality.

Methods

- A non-interventional, retrospective, cohort study utilizing US claims data was conducted to investigate the all-cause mortality associated with GPP. The study design is presented in Figure 1a.
- The study cohorts were constructed from Inovalon® Insights real-world claims data (1/1/2016 to 12/31/2019) (Figure 1b).
- Cohorts were defined using ICD-10 codes, with GPP corresponding to L40.1 and plaque PsO corresponding to L40.0.
- All-cause mortality was assessed during two periods: a 365-day post-index diagnosis and a maximum follow-up period for each patient (i.e. until the study period ended or a patient experienced an event).
- GPP patients were matched 1:2 to the plaque PsO and general population cohorts using index year, age, sex, insurance type, region, and Charlson Comorbidity Index (CCI). The risk of all-cause mortality was assessed using Cox proportional hazard models.

Figure 1. Study design and cohorts

Figure 1a. Study Design

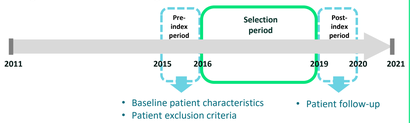
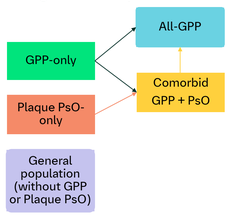
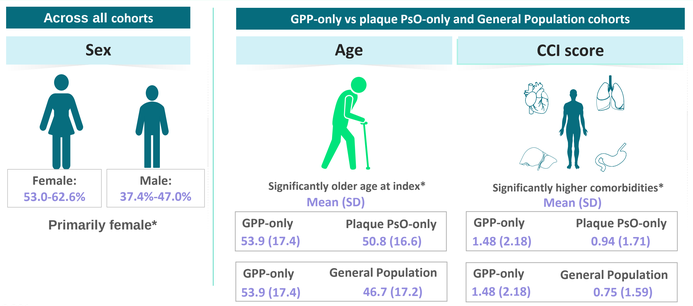


Figure 1b. Study Cohorts



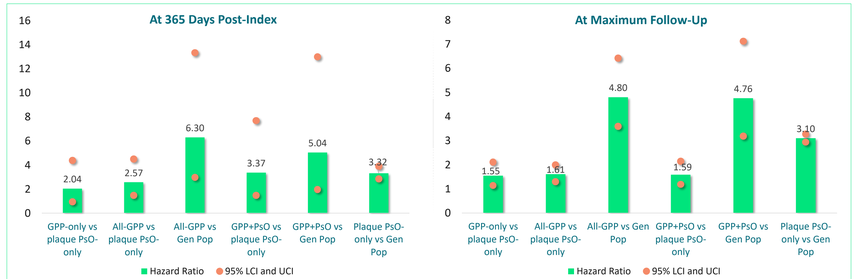
Results

Figure 2. Cohort demographics



- Patients across cohorts were primarily female and commercially insured
- Patients in the *GPP-only* cohort were significantly older at index and had significantly higher CCI scores compared with *plaque PsO-only* and *General Population* cohorts (p<0.001), which highlights the higher severity of GPP

Figure 3. GPP cohort exhibited higher risk of mortality than plaque PsO and general population cohorts



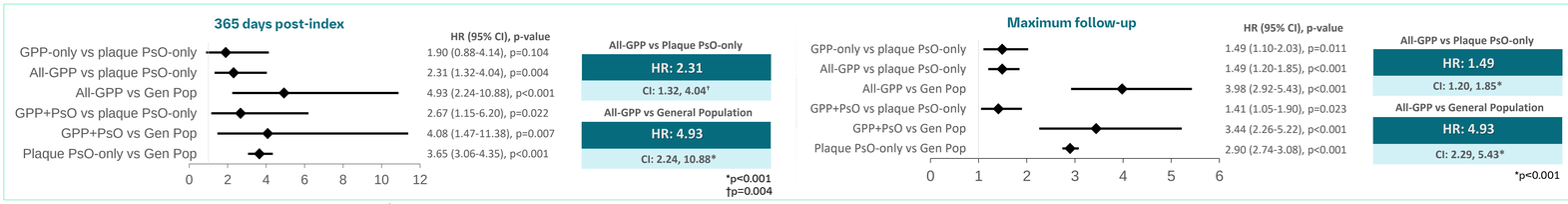
*All comparisons significant at p<0.05 level except for *GPP-only* vs *plaque PsO-only*

*All comparisons significant at p<0.05 level

All-GPP cohort exhibited a significantly higher risk of mortality compared to both the *plaque PsO-only* and *general population* cohorts (HR 2.57, 95% CI: 1.47 to 4.49, p<0.001 and HR 6.30, 95% CI: 2.97 to 13.34, p<0.001, respectively)

- *GPP-only* and *All-GPP* cohorts exhibited over 1.5 times higher risk of mortality than *plaque PsO-only* cohort
- *All-GPP* cohort demonstrated a mortality risk of nearly five times higher than that of the *general population* cohort (HR 4.80, 95% CI: 3.59 to 6.42, p<0.001)

Figure 4. GPP cohort showed higher risk of mortality compared to plaque PsO and general population cohorts (adjusted for CCI)



All-GPP cohort had a significantly higher risk of mortality compared with both the *general population* and *plaque PsO-Only* cohorts

All-GPP risk of mortality was 4 times higher than the *general population* and 1.5 times higher than the *plaque PsO-only* cohorts

Limitations

- Claims analyses are subject to the inherent limitations including the potential for missing data and errors or inconsistencies in the coding of diagnoses, procedures, or other variables.
- The causes of mortality were not included in the present study since these data were missing from the database; therefore, it was not possible to determine if mortality was attributable to GPP flares, comorbidities, or other factors.

Conclusion

- Patients in the *GPP-only* cohort had a significantly higher risk of mortality compared to both the matched *Plaque PsO-only* and *general population* cohorts.
- Although mortality rates for patients with GPP have decreased in recent decades due to available treatments, it is still higher than other types of psoriasis.[9]
- These results fill a significant gap in the existing literature and underscore the need for increased awareness of the mortality burden in GPP.

Key Finding

This US based claims study demonstrated a higher risk of mortality in GPP compared to both the matched *plaque PsO-only* and *general population* cohorts

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Abbreviations

CCI, Charlson Comorbidity Index; **CI**, confidence interval; **Gen Pop**, general population; **GPP**, generalized pustular psoriasis; **HR**, hazards ratio; **ICD**, International Classification of Diseases; **LCI**, lower confidence interval; **PsO**, plaque psoriasis; **SD**, standard deviation; **UCI**, upper confidence interval; **US**, United States

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