Title: The Healthcare Burden of Giant Cell Arteritis in South Australia

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Scientific Summary

Background and Rationale: Giant Cell Arteritis (GCA) is a systemic granulomatous vasculitis involving medium and large vessels. It is the most common vasculitis affecting the elderly. Peak age of onset is in the seventh and eighth decades. GCA is known to have significant morbidity related to disease burden and treatment related complications. Incidence rates and incurred healthcare costs are predicted to double in the Oceania region by 2050 due to population aging. There is a lack of comprehensive Australian data on current healthcare utilisation and long-term outcomes in GCA.

Aims: This retrospective population-based study aimed to quantify the burden of GCA on the South Australian (SA) healthcare system using longitudinal linkage across administrative health datasets to compare hospitalisation rates, length of stay, and comorbidity profiles in patients with biopsy-proven GCA against matched controls, thereby guiding future utilisation of healthcare services and research prioritisation to improve patient outcomes.

Primary outcomes of interest included hospitalisation rates and length of stay. Secondary outcomes examined the burden of comorbidity and disease complications, using the Eilexhauser comorbidity index and interrogation of specific disease- and treatment-related ICD-10 AM codes, such as fracture, infection, diabetes, and cardiovascular events.

Consent and Ethics: This study was approved by the SA Department for Health and Wellbeing Human Research Ethics Committee (DHW HREC) (Reference: 2022/HRE00040). A waiver of consent was obtained from the DHW HREC for all participants, as this retrospective population-based study did not contain identifiable data and the benefits from the research were deemed to justify the minimal risks of harm associated with not seeking consent, in accordance with the National Statement on Ethical Conduct in Human Research (2007).

Methods: Patients aged ≥50 with a positive temporal artery biopsy (TAB) were identified from the South Australian GCA Registry from 1992–2024. Controls were matched 4:1 on age, sex, and geographic area. Linked administrative datasets provided demographic data, hospitalization data and ICD-10-AM codes for principal and up to 29 secondary diagnoses from 2003–2022. Outcomes were analysed using time-to-first event and recurrent event time-to-event models, with adjustments for age, sex, and calendar year.

Results: The GCA cohort consists of 412 patients (65% female), and 1743 controls (66% female). Hospitalisation rates were higher in the GCA group compared to controls (HR = 1.73 95% CI 1.14, 2.61, p = 0.010, adjusted for gender and calendar year groups, matched for age). Amongst those with GCA, hospitalisation rates are highest in the first 2 years after diagnosis and have reduced over time.

A higher burden of comorbidity was evident across multiple disease categories when compared to controls, including Osteoporosis, Type 2 Diabetes Mellitus, Infection, Stroke and Venous Thromboembolism. As was the cumulative burden of comorbidity based on the Elixhauser comorbidity index.

Conclusions and Implications:

This study confirms that GCA is associated with a substantial, long-term health burden that extends beyond the acute inflammatory phase of the disease. The increased risk of comorbid conditions is likely multifactorial, reflecting not only the chronic systemic inflammation of GCA but also the long-term use of glucocorticoids.

The chronic systemic inflammation, coupled with prolonged glucocorticoid therapy, likely contributes to a complex trajectory of multimorbidity and healthcare use. Importantly, many of the increased risks observed—such as infection, cardiovascular disease, osteoporosis, and diabetes—are potentially modifiable through proactive management.

From a clinical perspective, these findings reinforce the importance of:

- Early identification and treatment of GCA;
- Use of steroid-sparing agents where feasible;
- Routine monitoring for adverse effects of therapy;

- Coordinated, multidisciplinary care for long-term disease management.

These findings have implications for long-term management strategies. Patients with GCA should be considered high-risk and may benefit from proactive monitoring for cardiovascular, metabolic, infectious, and psychiatric complications. Importantly, these results also underscore the need for effective steroid-sparing treatments and multidisciplinary care models.

From a systems perspective, the findings highlight the significant health service burden associated with GCA and the importance of developing care pathways that anticipate long-term needs rather than focusing solely on the acute phase.

Knowledge Translation and Future Directions: The findings will inform clinicians, clinical researchers, and healthcare planners about the broader impact of GCA on the healthcare system. Future research should investigate:

- Explore predictors of poor long-term outcomes in GCA;
- Evaluate interventions that might reduce avoidable hospitalisations and improve quality of life in this vulnerable population;
- Assess the role of biologic agents in reducing long-term hospitalisations;
- Evaluate models of care that integrate preventive strategies and comprehensive geriatric assessment;
- Extend this data linkage approach to explore cost-effectiveness and health economic impact.

Dissemination of Results: The results from this data are in the final stages of manuscript preparation. The results will be disseminated to clinicians, rheumatology networks, and policymakers to enhance awareness of the extended burden of GCA. We anticipate submitting the findings to a peer-reviewed journal and it is also anticipated that the data will be presented at national and international conferences in 2026.

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Layman's Summary

Giant Cell Arteritis (GCA) is an autoimmune condition causing inflammation of medium and large blood vessels, known as vasculitis. GCA is the most common vasculitis affecting people over the age of 50. It is a complex and sometimes difficult to diagnose condition. If not treated quickly, it can cause serious problems like blindness or stroke. Doctors usually treat it with prednisolone, a type of steroid, which are very effective but can also have serious side effects, especially when taken for a long time.

In this study, we looked at how GCA affects people's health in the long run. We used health records from thousands of people to compare those with GCA to people without the disease. We looked at how often people went to hospital and what conditions they were treated for.

We found that people with GCA were more likely to be hospitalised, not just for the GCA itself, but for a wide range of other health problems, including stroke, infections, diabetes and osteoporosis.

These health problems may be due to the disease itself or to the side effects of long-term steroid use. This tells us that GCA can have lasting effects on many areas of health. It also shows the importance of regular check-ups and good long-term care for people living with GCA, not just to manage their symptoms but to help prevent other serious health issues down the track.

Thanks to funding from Arthritis Australia and the Australian Rheumatology Association Research Fund, this research helps shine a light on how complex GCA can be and the importance of good long-term care.