Impact of Biologic Therapy on Mortality rate in Patients with Rheumatoid-Arthritis-Associated Corneal Ulceration (RACU)

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Introduction

Rheumatoid arthritis (RA) is the most **prevalent autoimmune disease** associated with destructive corneal involvement. RA-related ocular disease commonly manifests as peripheral ulcerative keratitis (PUK), which may progress to corneal melting, perforation, and irreversible visual loss. Importantly, patients with RA-associated corneal complications have a markedly increased mortality rate, with reported five-year mortality of up to **80%.**[1]

The introduction of biological therapies for RA, including TNF-α inhibitors, has significantly improved ocular and visual outcomes. However, the impact of these therapies on **overall mortality in** patients with RA-associated corneal disease remains unclear.

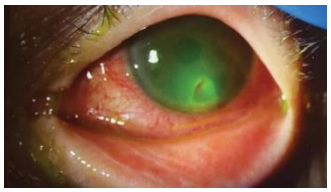

Figure 1[2]
Untreated seropositive erosive RA leading to PUK , reproduced from Cleveland Clinic Consult QD.

Methods

A retrospective cohort review of **17 patients** with RA-associated PUK (2005–2025 at Southampton General Hospital) with some having additional autoimmune comorbidities. Patients were stratified by systemic treatment (biologics ± DMARDs, DMARDs alone, steroids only, or none). Corneal perforation and mortality outcomes were compared descriptively between groups.

Results

Overall mortality was **41% (7/17)**, comparable to previously reported mortality **(~42%).**
Mortality was **33.3%** in the biologic group, **50%** in the DMARD-only group, and **100%** in untreated and steroid-only patients.
Corneal perforation occurred in **17.6% (3/17)** of patients.
All untreated patients died.

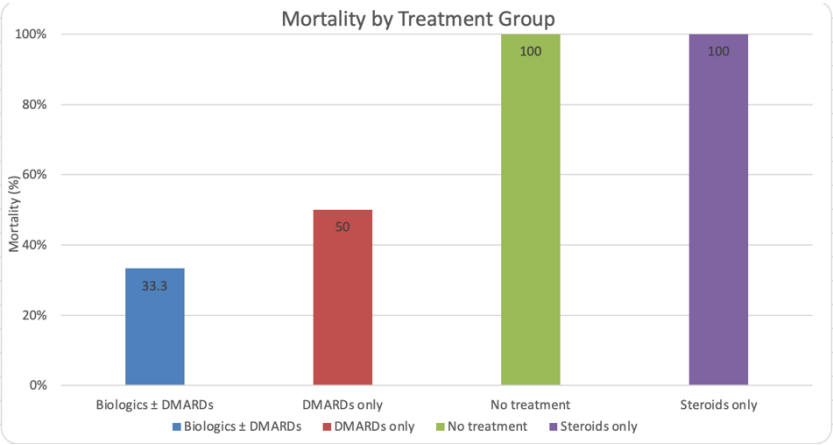

Figure 2
Bar chart showing mortality percentage

Treatment Group	Total (n)	Deaths (n)	Mortality (%)	Corneal Perforation (n)
Biologics with or without DMARDs	12	4	33%	1
DMARDs only	4	2	50%	1
No systemic treatment	2	2	100%	1
Steroid-only therapy	1	1	100%	0
Total	**17**	**7**	**41%**	**3**

Figure 3
Table illustrating mortality rate and corneal perforation

Discussion

Mortality rate in this cohort was high at **41%**, consistent **with previous 5-year mortality rate of 42%**[3] .

Biologic-treated patients had a lower mortality rate of **33%,** suggesting a potential benefit , although limited by **small sample** and **lack of follow-up data.** Interestingly, this was notably lower compared to patients receiving solely **DMARD therapy at 50%.**

Notably, untreated patients had **100% mortality**, highlighting severity of RA and importance of timely systemic treatment

Corneal perforation occurred across treatment groups, suggesting complication may reflect underlying disease severity rather than treatment effect.

Mortality in this cohort is likely **multifactorial,** with advanced rheumatoid arthritis, coexisting autoimmune disease and comorbidities such as malignancy, diabetes, and frailty contributing to **poor outcomes**

Conclusion

Rheumatoid arthritis–associated peripheral ulcerative keratitis remains a condition associated with **high mortality**. The overall mortality of 41% was comparable to reported 5-year mortality (~42%) [3].
Biologic therapy was associated with **lower observed mortality**, while untreated disease showed **poor outcomes**.
Mortality is likely **multifactorial**, reflecting advanced disease, coexisting autoimmune conditions, and comorbidities.

Larger studies with standardised longitudinal follow-up (≥5 years), incorporating **visual acuity outcomes, demographic data, treatment exposure, and autoimmune comorbidity profiles**, are required to better define the impact of biologic therapy on survival, with future **Kaplan–Meier analysis** to assess time-to-event outcomes.

References

1) Foster CS et al. 1984. *Ophthalmology.* 1984;91(10):1253–1263. **2)** Cleveland Clinic. Peripheral ulcerative keratitis in untreated rheumatoid arthritis. Consult QD, **3)** Mallem K et al. Clinical outcomes in peripheral ulcerative keratitis. *Am J Ophthalmol.* 2025.