

Background

C3 Glomerulopathy (C3G) is an ultra-rare kidney disease characterized by dysregulation of the alternative complement pathway. Most patients reach end-stage renal disease (ESRD) within 10 years of diagnosis. The complement inhibitor, eculizumab, has been used to treat C3G with mixed results. In this study, the differences in Glomerular Filtration Rate (GFR) and Urine Protein-Creatinine ratio (UPC) trends were compared in a cohort of C3G patients before and after eculizumab initiation.

Methods

Fourteen patients from the University of Iowa's C3G Natural History Study were included in the cohort. Inclusion criteria included a baseline native biopsy diagnosis of C3G and ≥ 1 year of clinical data (C3, GFR, UPC) prior to and after starting eculizumab. Exclusion criteria included treatment with other complement inhibitors, dialysis, and kidney transplant. Simple linear regression of the change in GFR and UPC before and after eculizumab initiation was measured. Paired t-test were used to evaluate the significance of GFR and UPC change pre-post treatment; $p < 0.05$.

Results

GFR changes per year pre/post eculizumab were not significant ($p = 0.2$). However, trends showed a pattern of decline with a median difference in GFR change per year from pre- to post-eculizumab of -6.47. UPC change per year was also nonsignificant ($p = 0.9809$). The variability across patients was considerable, causing a median difference in UPC change per year pre/post eculizumab of -0.26 for the group. C3 was unchanged (pre and post – data not shown).

Results

Figure 1: Change in GFR and UPC Pre/Post Eculizumab in Individuals

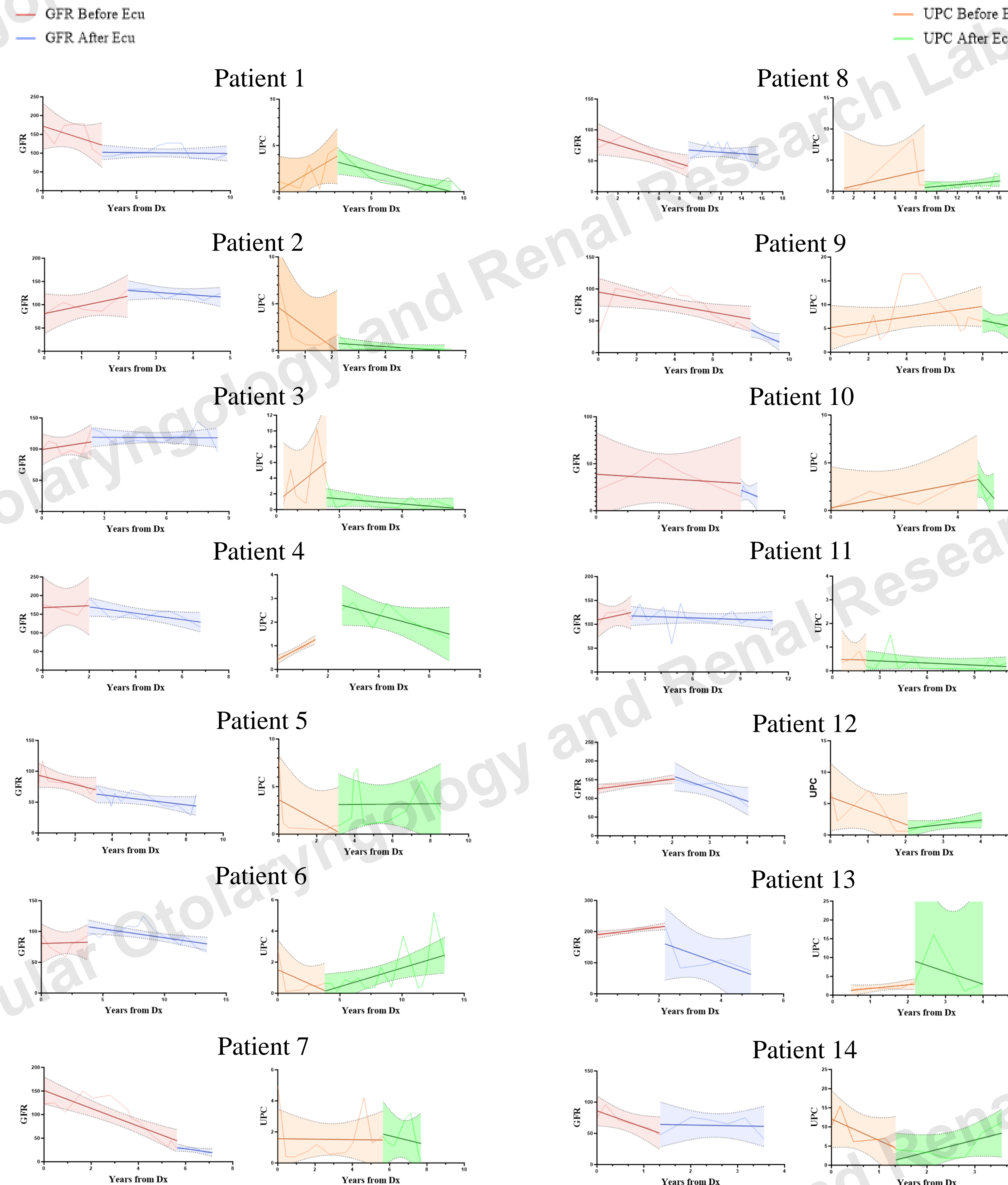
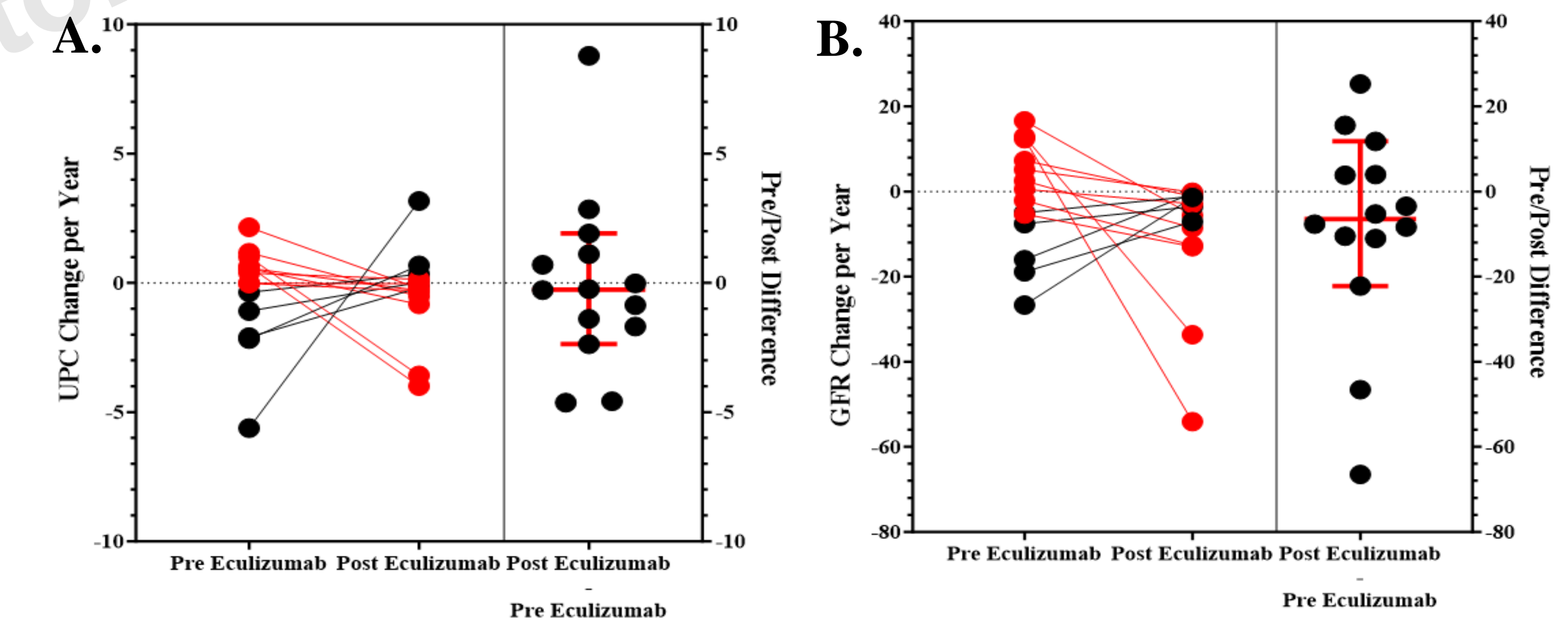


Figure 2: A. Change in UPC Pre/Post Eculizumab
B. Change in GFR Pre/Post Eculizumab



Conclusions

- We provide a summary of GFR and UPC outcomes before and after eculizumab treatment in C3G patients.
- Most patients showed no significant change in disease trajectory with eculizumab therapy.
 - There was a general trend towards worsening kidney function following eculizumab, and a slight decrease in UPC.
 - GFR had a median difference from pre- to post-eculizumab of -6.47 per year.
 - UPC had a median difference from pre- to post-eculizumab of -0.26 per year.

Limitations and Future Directions

The limitations of our study include small sample size and gross slope estimation with only simple linear regression. Further directions include examining baseline C3G histology, complement biomarkers, and other clinical markers to determine if outcome may be predicted.

References

1. *Am. J. Nephrol.*, 44(3), 187–193, (2016)
2. *Clin. J. Am. Soc. Nephrol.*, 12(11), 1862-1872, (2017)
3. *Am J Kidney Dis.*, 34(6), 1129-1131, (1999)

