Correlation of adenoviral titers with severity of adenoviral conjunctivitis and viral clearance over 21 days

Morettin, Christina E.; Harthan, Jennifer S.; Huecker, Julia; Perera, Chamila D.; Than, Tammy P.; Shorter, Ellen; Whiteside, Meredith; Johnson, Spencer; Hartwick, Andrew; Margolis, Mathew; Migneco, Mary K.; Alferez, Christopher; Camp, Devon; Haertter, Len; Gordon, Mae O

INTRODUCTION

- Adenoviral conjunctivitis (Ad-Cs) is a highly contagious eye infection that has significant morbidity and economic impact. Determining return to work or school can be challenging for clinicians.
- The Reducing Adenoviral Patient Infected Days (RAPID) study is a double-masked randomized pilot study examining the safety and efficacy of a single administration of ophthalmic 5% Povidone-Iodine (PVP-I) for the treatment of Ad-Cs.

PURPOSE

- To investigate the correlation of viral titers at baseline and over 21 days with severity of signs, symptoms, and viral clearance in participants with Ad-Cs.

METHODS

Sample

- Eligibility included age ≥ 18, symptoms ≤ 4 days, and a positive AdenoPlus (Quidel, San Diego CA) point-of-care immunoassay.
- Of 212 participants screened, 56 were randomized to a single, in-office administration of either 5% povidone-iodine (PVP-I) or artificial tears (AT).

Measures

- Baseline examinations and follow-up visits at days 1-2, 4, 7, 14 and 21.
- At each visit, a masked clinician administered a symptom survey, graded clinical signs, and obtained a conjunctival swab for qPCR analysis.
- Participants rated symptoms on a scale of 0 (not bothersome) to 10 (very bothersome).
- Masked clinicians rated clinical signs of the study eye on a scale of 0 (absent) to 4 (severe).

Statistical Analysis

- Correlation (r) of viral titers with signs and symptoms over 21 days was calculated using repeated measures generalized estimating equations.
- Days to viral clearance is reported for 3 equal size tertiles of baseline viral titers: low (log qPCR <6.13), middle (log qPCR 6.13-6.78) and high (log qPCR >6.78).

RESULTS

- Twenty-five participants were qPCR positive for adenovirus and had sufficient follow-up visits.
- Higher viral titers over 21 days were correlated with:
  - Greater severity of participant reported symptoms of tearing, matting and redness (r≥0.70; p<0.02), Figure 1.
  - Greater severity of masked clinician graded signs of bulbar redness and serous discharge (r≥0.60; p<0.01), Figure 2.
  - Longer time to viral clearance (r=0.59, p=0.0075), Figure 3.
- Days to viral clearance in low, middle and high baseline viral titer tertiles were 10.3 + 5.6, 9.5 + 3.5, and 19.8 + 3.8, respectively, Figure 3.
- Incidence of subepithelial infiltrates or pseudomembranes was greater in the highest tertile (75%, 6 of 8) compared to the lowest tertile of baseline log qPCR (40%, 4 of 10, p=0.43).

FIGURE 1
Correlations between patient reported symptoms and log qPCR over 21 days.

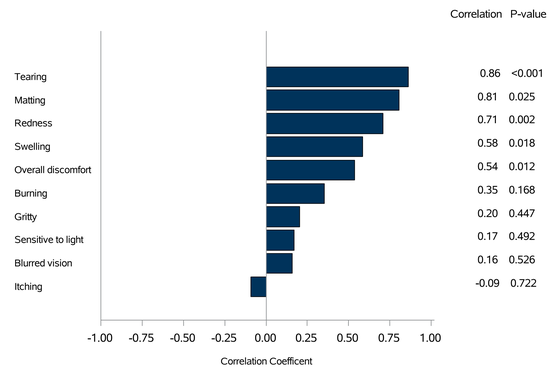


FIGURE 2
Correlations between clinician graded signs and log qPCR over 21 days.

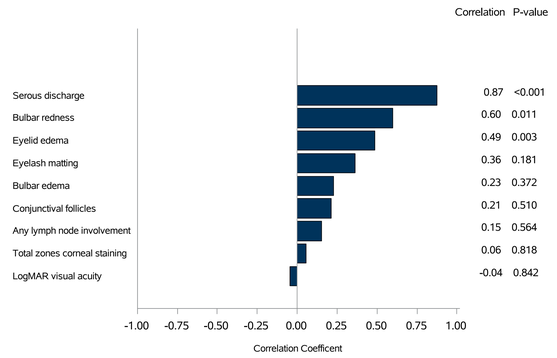
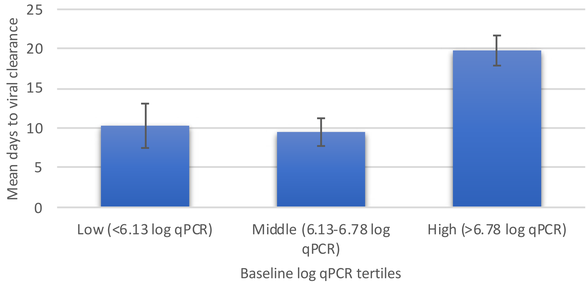


FIGURE 3
Days to viral clearance in high, middle and low baseline log qPCR tertiles.



DISCUSSION

- This is among the first reports comparing severity of signs and symptoms with longitudinal viral titers over 21 days of follow-up visits.
- Higher viral titers correlated with worse signs and symptoms and longer time to viral clearance over 21 days.
- Higher incidence of sequelae (pseudomembranes or subepithelial infiltrates) was correlated with higher baseline viral titers.

CONCLUSION

- Higher viral titers longitudinally were strongly correlated with more severe signs and symptoms.
- Higher baseline viral titers were associated with longer time to viral clearance.

SUPPORT

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CONTACT INFORMATION

Christina Morettin, O.D.
CMorettin@ico.edu
www.ico.edu