



HOSPITAL

History of Systemic Corticosteroid Use Prior to Pars Plana Vitrectomy – Long-term Outcomes at 1 Year



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PURPOSE

To study the outcomes at 1 year after pars plana vitrectomy (PPV) in patients with a history of systemic corticosteroid use prior to PPV.

INTRODUCTION

- Pars Plana Vitrectomy is a common treatment modality used for a variety of vitreoretinal disorders.
- Corticosteroid usage is also often used in various ophthalmic disorders, due to their anti-inflammatory effects and/or inhibition of leukocyte adhesion that's induced by VEGF-A¹.
- While corticosteroid use has its role in positively impacting the resolution of certain ophthalmic disorders, there have been studies proving how prior systemic corticosteroid usage can induce a heightened inflammatory state that can propel the progression of several ophthalmologic diseases, including cataracts and glaucoma².
- No studies have yet examined how prior usage of systemic corticosteroid can impact outcomes of PPV.

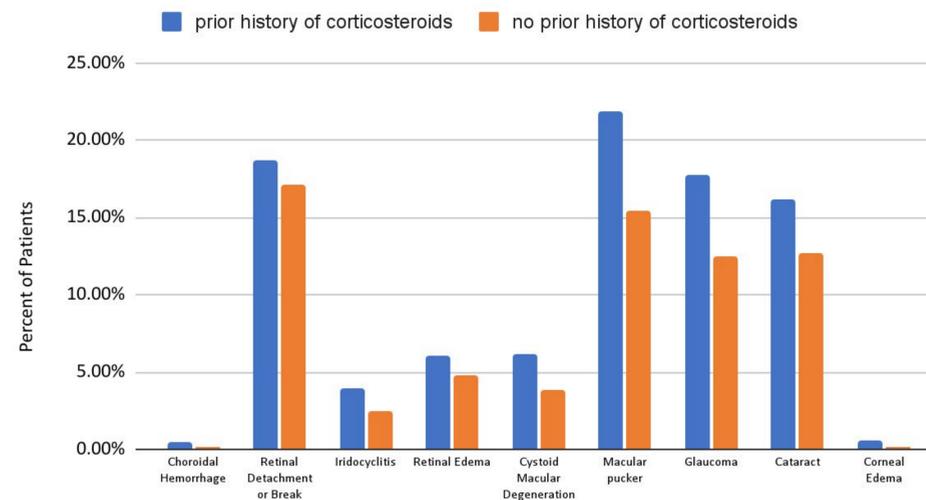
METHODS

- A retrospective cohort study was performed using TriNetX (Cambridge, MA, USA), a federated electronic health records research network comprising multiple health organizations in the United States.
- Patients who underwent PPV were identified using a series of ICD-10 codes and stratified into 2 cohorts - with or without a history of systemic corticosteroid use prior to PPV.
- Each subject was matched to a control based on age, sex, BMI and the presence or absence of hypertension, diabetes mellitus, chronic lower respiratory diseases, heart failure, nicotine dependence and alcohol related disorders
- The primary endpoint of the study was the incidence of vitreous hemorrhage (VH), choroidal hemorrhage, retinal detachment or break, iridocyclitis, retinal edema, cystoid macular degeneration, macula pucker, glaucoma, cataract, corneal edema, central retinal vein occlusion (CRVO) and central retinal artery occlusion (CRAO).

RESULTS

Outcomes	PPV with history of systemic corticosteroid use (N=12,876)	PPV without history of systemic corticosteroid use (N=12,876)	Risk Ratio	95% Confidence Interval	P-value
Choroidal hemorrhage	0.5% (69)	0.2% (32)	2.16	1.42, 3.28	<0.001
Retinal detachment or break	18.7% (2406)	17.1% (2200)	1.09	1.04, 1.15	0.001
Iridocyclitis	4% (512)	2.5% (323)	1.59	1.38, 1.82	<0.001
Retinal edema	6.1% (788)	4.8% (621)	1.27	1.15, 1.41	<0.001
Cystoid macular degeneration	6.2% (796)	3.8% (493)	1.61	1.45, 1.8	<0.001
Macular pucker	21.9% (2817)	15.4% (1977)	1.42	1.35, 1.5	<0.001
Glaucoma	17.8% (2290)	12.5% (1608)	1.42	1.34, 1.51	<0.001
Cataract	16.2% (2085)	12.7% (1630)	1.28	1.2, 1.36	<0.001
Corneal edema	0.6% (71)	0.2% (30)	2.37	1.55, 3.62	<0.001
Vitreous hemorrhage	21.2% (2734)	21.5% (2764)	0.99	0.94, 1.04	0.648
Central retinal vein occlusion	1% (135)	1.3% (161)	0.84	0.67, 1.05	0.129
Central retinal artery occlusion	0.2% (24)	0.2% (26)	0.92	0.53, 1.61	0.777

1-Year Outcomes



A total of 25,752 patients were included in the analysis with 12,876 patients in each of the cohorts after propensity matching. At 1-year post-PPV, the cohort with a history of systemic corticosteroid use prior to PPV were at greater risk for choroidal hemorrhage (RR 2.16; CI 1.42, 3.28), retinal detachment or break (RR 1.09; CI 1.04, 1.15), iridocyclitis (RR 1.59; CI 1.38, 1.82), retinal edema (RR 1.27; CI 1.15, 1.41), cystoid macular degeneration (RR 1.61; CI 1.45, 1.8), macula pucker (RR 1.42; CI 1.35, 1.5), glaucoma (RR 1.42; CI 1.34, 1.51), cataract (RR 1.28; CI 1.2, 1.36) and corneal edema (RR 2.37; CI 1.55, 3.62).

CONCLUSIONS

- Long-term corticosteroid use has been linked with increased intraocular pressure leading to glaucoma², development of cataracts and even central serous chorioretinopathy^{3,4}. However, the long-term effects of systemic corticosteroid use prior to PPV have not been previously studied.
- Patients with a history of systemic corticosteroid use prior to PPV are at greater risks of long term complications at 1-year post-PPV.
- It is hypothesized that either the transactivation of anti-inflammatory genes or transpression of inflammatory genes⁵, causes patients with long-term corticosteroid use to develop a heightened inflammatory response from the underlying disease process meant to be treated by the corticosteroid.
- The findings from this study can facilitate preoperative counseling with patients regarding potential surgical risks and post-operative complications.
- Strengths of this study include the large sample size arising from various institutions across the US, while limitations include the unknown duration and indication of corticosteroid therapy in these patients.

REFERENCES

1. Zhang, X., Wang, N., Schachat, A. P., Bao, S., & Gillies, M. C. (2014). Glucocorticoids: structure, signaling and molecular mechanisms in the treatment of diabetic retinopathy and diabetic macular edema. *Current molecular medicine*, 14(3), 376–384. <https://doi.org/10.2174/1566524014666140128114414>
2. Yasir, M., Goyal, A., & Sonthalia, S. (2021). Corticosteroid Adverse Effects. In *StatPearls*. StatPearls Publishing.
3. Gupta, V. B., Rajagopala, M., & Ravishankar, B. (2014). Etiopathogenesis of cataract: an appraisal. *Indian journal of ophthalmology*, 62(2), 103–110. <https://doi.org/10.4103/0301-4738.121141>
4. Nicholson, B. P., Atchison, E., Idris, A. A., & Bakri, S. J. (2018). Central serous chorioretinopathy and glucocorticoids: an update on evidence for association. *Survey of ophthalmology*, 63(1), 1–8. <https://doi.org/10.1016/j.survophthal.2017.06.008>
5. Liu, D., Ahmet, A., Ward, L., Krishnamoorthy, P., Mandelcorn, E. D., Leigh, R., Brown, J. P., Cohen, A., & Kim, H. (2013). A practical guide to the monitoring and management of the complications of systemic corticosteroid therapy. *Allergy, asthma, and clinical immunology : official journal of the Canadian Society of Allergy and Clinical Immunology*, 9(1), 30. <https://doi.org/10.1186/1710-1492-9-30>

SUPPORT



DISCLOSURE

None (All Authors)