DOI:10.14744/bej.2021.92408
Beyoglu Eye J 2021; 6(2): 96-101

Original Article

Intraocular Pressure Change and Sustained Intraocular Pressure Elevation After Pars Plana Vitrectomy

Kubra Serefoglu Cabuk,[1] Osman Cekic[2]

[1]Department of Ophthalmology, University of Health Sciences, Beyoglu Eye Training and Research Hospital, Istanbul, Turkey
[2]Department of Ophthalmology, Marmara University Faculty of Medicine, Istanbul, Turkey

Abstract

Objectives: The aim of this study was to investigate the incidence and influential factors of changes in intraocular pressure (IOP) and sustained IOP elevation (SIOPE) after an uncomplicated pars plana vitrectomy (PPV).

Methods: In all, 41 eyes of 41 patients who underwent PPV due to the presence of epiretinal membrane, macular hole, or vitreomacular traction syndrome were included in the study. In the vitrectomized eye, an elevated IOP of ≥21 mmHg or an increase of ≥6 mmHg from the preoperative IOP on 2 or more postprocedure visits or the addition of a new IOP-lowering medication during follow-up was defined as sustained IOP elevation. The results of procedures performed with a 20-G instrument and a 23-G instrument were compared.

Results: The mean postoperative IOP was significantly higher than the preoperative IOP in vitrectomized eyes (preoperative IOP: 15.2±3.1 mmHg; postoperative 1st month: 17.4±5.8 mmHg, p=0.018; 6th month: 17.3±2.6 mmHg, p=0.02; 12th month: 16.7±2.6 mmHg, p=0.020). While no significant difference in IOP was detected between the vitrectomized and fellow eyes preoperatively, the IOP was significantly higher in the vitrectomized eyes in the 1st, 6th, and 12th months (p=0.040, p <0.001, p <0.001, respectively). SIOPE was detected in 15 vitrectomized eyes (37%) and 1 fellow eye (2%). The postoperative first day IOP was significantly lower in the vitrectomized eyes (11.1±6.1 vs 15.4±2mmHg; p<0.001) and significantly lower in the 23-G group than the 20-G group (9.3±5.2 vs 15.7±5.8; p=0.001).

Conclusion: IOP may rise significantly in comparison with the fellow eye or the preoperative IOP, even after an uncomplicated PPV. SIOPE and preoperative IOP values should be taken into consideration in addition to cross-sectional IOP findings in the evaluation of PPV.

Keywords: Intraocular pressure, pars plana vitrectomy, sustained intraocular pressure elevation

Introduction

Intraocular pressure (IOP) elevation after an uncomplicated pars plana vitrectomy (PPV) is common in the early postoperative period. This elevation can be due to factors such as viscoelastic residue, the use of silicone oil or an expanding gas tamponade, bleeding, a pupillary block, ciliary body edema, inflammation, or a response to topical corticosteroid therapy (1-5). The indications for PPV and the gauge of the instruments used during the procedure can have an impact on the postoperative IOP (6-8). Medical treatment will effectively reduce the IOP in most cases, but resistant glaucoma can occur (2,3,9).

How to cite this article: Serefoglu Cabuk K, Cekic O. Intraocular Pressure Change and Sustained Intraocular Pressure Elevation After Pars Plana Vitrectomy. Beyoglu Eye J 2021; 6(2): 96-101.

Address for correspondence: Kubra Serefoglu Cabuk, MD. Beyoglu Goz Egitim ve Arastirma Hastanesi, Saglik Bilimleri Universitesi, Goz Hastaliklari Anabilim Dali, Istanbul, Turkey
Phone: +90 532 770 08 06 **E-mail:** drqubra@gmail.com

Submitted Date: November 25, 2020 **Accepted Date:** April 19, 2021 **Available Online Date:** June 08, 2021

In addition to an IOP elevation after PPV, some researchers have reported increased risk of open-angle glaucoma (OAG) formation, accelerated progression of pre-existing glaucoma, and a need for additional drugs, while others have found that PPV did not affect IOP (9-16).

Postoperative IOP monitoring is important to preserve vision, even with a successful PPV (10). Some studies have defined ocular hypertension (OHT) as an IOP >30 mmHg detected in the first 24 hours after the procedure, >25 mmHg in the first 6 weeks, and >22 mmHg thereafter (14). In recent studies, sustained IOP elevation (SIOPE) has been defined as an IOP of ≥21 mmHg or a ≥ 6mmHg change from the baseline IOP observed at 2 consecutive visits, or the addition of a new IOP-lowering medication during follow-up (17). Antiglaucomatous therapy or other glaucoma unit care has been recommended for cases of OHT or SIOPE (8-11).

The objective of this study was to investigate changes in IOP, SIOPE, and other factors affecting the findings in 1 year of follow-up of patients who underwent an uncomplicated PPV performed due to epiretinal membrane (ERM), macular hole (MH), or vitreomacular traction syndrome (VMT).

Methods

Ethics committee approval was obtained from the ethics committee of Bezmialem Valide Sultan Foundation for the Poor Training and Research Hospital on August 19, 2009 (No: 8/3). All of the patients provided informed consent and this retrospective study was conducted in accordance with the Helsinki Declaration.

A total of 41 eyes of 41 patients who underwent a PPV performed at a tertiary care hospital due to ERM, VMT, or MH were included in the study. All of the surgeries were performed under general anesthesia. Phacoemulsification (Alcon Infiniti; Alcon AG, Geneva, Switzerland) and intraocular lens (IOL) implantation were performed first in patients who were deemed suitable for cataract surgery. After a PPV to remove the central vitreous (Accurus; Alcon AG, Geneva, Switzerland), the posterior hyaloid was separated when necessary using triamcinolone acetonide. In cases of ERM, both the internal limiting membrane and ERM were peeled off using brilliant blue G membrane dye. Surgery was terminated with an air, liquid, sulfurhexafluoride (SF6) or perfluoropropane (C3F8) gas tamponade. In cases of 20-G PPV, 3 scleral ports were used, and in 23-G cases, a leaky entrance was closed with 7.0 Vicryl sutures (Ethicon, Inc., Somerville, NJ, USA). Similarly, a conjunctival periotomy was closed with 7.0 Vicryl sutures. Follow-up was conducted for at least 6 months.

Patients with proliferative diabetic retinopathy, myopic maculopathy, senile macular degeneration, endophthalmitis, or a history of a retinal artery or vein occlusion, glaucoma, or OHT were not included in the study. Cases with the use of a silicone oil tamponade, scleral buckling, complicated or bilateral PPV, or <12 months of follow-up data were also excluded. These criteria were applied to both eyes.

A complete ophthalmological examination, including best corrected visual acuity, IOP measurement, and an anterior and posterior segment examination of the operated and fellow eye was performed preoperatively and at the postoperative first day, first month, third month, sixth month, and first year. Macular optical coherence tomography (OCT) images were obtained using a Zeiss Stratus OCT device (Carl Zeiss AG, Oberkochen, Germany). IOP was measured with a Tono-Pen XL tonometer (Reichert Inc., Depew, NY, USA) on postoperative day 1, and a Goldmann applanation tonometer on subsequent examinations.

All of the statistical analysis was performed with IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). The Student t-test was used in group comparisons of parameters. Spearman's correlation analysis, a chi-squared test, and Fisher's exact test were used to evaluate the relationships between parameters. Values were presented as mean±SD. A p value of ≤0.05 was considered statistically significant.

Results

Demographic details and clinical characteristics of the patients are presented in Table 1.

A significant decrease in IOP in the operated eye was seen on the first postoperative day. However, the 1st-month, 6th-month, and 12th-month measurements revealed a significant elevation in IOP compared with the preoperative IOP, though the mean IOP was <21mmHg (Table 2).

SIOPE was detected in 15 patients (37%) in the vitrectomized eye and in 1 fellow eye (2%) (p=0.366). The IOP was ≥21 mmHg in 9 of the vitrectomized eyes (22%), the IOP change was recorded as ≥6 mmHg during 2 or more visits in 3 cases (7%), and both were seen in 4 (2%). Among the patients with SIOPE, topical antiglaucomatous therapy was initiated in 2 patients with an IOP of 33 mmHg in the first month. SIOPE persisted through the final follow-up visit in 5 patients. In the fellow eye, 1 case of SIOPE was observed (IOP ≥21 mmHg) at 2 consecutive follow-ups examinations, but had regressed to <21mmHg at the final visit.

The first postoperative day IOP was significantly lower in the 23-G group than in the 20-G group (9.3±5.2 vs 15.7±5.8; p=0.001). There was a negative correlation between instrument gauge and the first postoperative day

Table 1. Demographic, clinical, and surgical characteristics of the patients and SIOPE occurrence

	SIOPE (n, % within subgroup)		p
Age (years; mean±SD)	67.2±9	15	>0.05
Sex			
Male	15 (37)	6 (40)	
Female	26 (63)	9 (35)	
Side			
OD	20 (49)	7 (35)	
OS	21 (51)	7 (33)	
Indication			
MH	11 (27)	3 (27)	
ERM	26 (63)	9 (35)	
VMT	4 (10)	3 (75)	
Lens status			
Phakic	28 (68)	10 (36)	
Pseudophakic	13 (32)	5 (39)	
Instrument			
20-gauge	12 (39)	6 (50)	
23-gauge	29 (71)	9 (31)	
Surgery			
PPV	36 (78)	13 (36)	
Phaco-PPV	5 (12)	2 (40)	
Tamponade			
Fluid	12 (29)	5 (42)	
Air	16 (39)	6 (38)	
C3F8	5 (12)	0	
SF6	8 (20)	4 (50)	

% within the group, Spearman's correlation analysis, p<0.05 was accepted statistically significant; C3F8: Perfluoropropane; ERM: Epiretinal membrane; MH: Macular hole; OD: Right eye; OS: Left eye; Phaco-PPV: Phacoemulsification and pars plana vitrectomy; PPV: Pars plana vitrectomy; SF6: Sulfurhexafluoride; SIOPE: Sustained intraocular pressure elevation; VMT: Vitreomacular traction.

Table 2. Change in intraocular pressure of the vitrectomized and fellow eye

	IOP (mmHg, mean±SD)	p
Preoperative	15.2±3.1	
Postoperative		
1st day	11.2±0.95	<0.001*
1st month	17.4±5.83	0.018*
3rd month	16.28±3.58	0.354
6th month	17.28±2.59	0.02*
12th month	16.76±2.63	0.02*

Paired-samples t-test, *p<0.05; IOP: Intraocular pressure.

IOP (p=0.002; r:-0.474).

No significant correlation was found between SIOPE and the age, sex, surgical indication (ERM, VMT, MH), type of surgery (PPV or phaco-PPV), gauge of instrument (20-G or 23-G), condition of the lens (phakic or pseudophakic). However, the percentage of SIOPE was higher in the 20-G PPV and VMT patients (Table 3).

Phacoemulsification and IOL implantation were performed in 6 of 11 patients who developed cataracts during the follow-up period. Anatomical and/or functional success was achieved in all of the patients; it was not successful in 4 patients with a macular scar, foveal atrophy, or advanced stage MH.

Table 3. Mean intraocular pressure values of the vitrectomized and fellow eye

Intraocular pressure	Vitrectomized eye	Fellow eye	p
Preoperative (mmHg, mean±SD)	15.3±3.2	15.5±2.2	0.75
1st day	11.1±6.1	15.4±2	<0.001
1st month	17.4±5.8	15.2±1.8	0.4
Postoperative (mmHg, mean±SD)			
3rd month	16.2±3.5	14.9±1.9	0.73
6th month	17.3±2.6	15.2±1.7	<0.001
12th month	16.8±2.6	15.1±1.7	0.001

Independent-samples t-test, p<0.05 statistically significant.

Discussion

The results of this study demonstrated a significant increase in IOP after PPV at the 1st, 6th, and 12th months of follow-up compared with the preoperative IOP measurement. The postoperative first day IOP was significantly lower in the vitrectomized eyes and significantly lower in the 23-G group than the 20-G group.

IOP elevation is common after PPV and should be monitored carefully (6, 14). It has been recommended that cases of SIOPE occurring after a intravitreal injection, OHT, or suspicion of glaucoma should be referred to a glaucoma unit (14, 17-20)

Chang (2) defined glaucoma suspicion as an IOP of ≤25 mmHg or 4 mmHg higher than the fellow eye with no visual field loss and no cup/disc ratio difference of >0.2 in 3 or more visits. Antiglaucomatous treatment was not initiated in these patients. Based on a diurnal variation of 3.7 mmHg in eyes without glaucoma, Lalezary et al. (15) evaluated the incidence of OAG, increase in IOP of >4 mmHg, and any change in IOP in 66 unilateral PPV patients with the indications of vitreous hemorrhage, ERM, MH, RD, macular edema, or tractional retinal detachment. They reported no significant difference in IOP elevation between the vitrectomized and the fellow eyes, but a higher as percentage in the PPV group (15% and 9% respectively) in 49 months of follow-up using either a Tono-Pen or Goldmann applanation tonometry. The study authors did not indicate the gauge of the instruments, and 60% of the patients were diabetics, which could explain the negative finding. Tognetto et al. (21) defined OHT as an IOP of >22 mmHg determined at least 2 postoperative visits or an increase in IOP of >4 mmHg above the preoperative IOP. They reported 5.7% OHT in both the vitrectomized and the fellow eyes of 368 patients who underwent PPV for an idiopathic epiretinal membrane. This study examined 23-G, 25-G, and 27-G, but not 20-G PPV. Wu et al. (11) defined SIOPE as IOP ≥24 mmHg or 5 mmHg higher than the preoperative IOP, and reported that it was significantly higher in the vitrectomized eye than the fellow eye (19.2% vs 4.5%; p<0.0001) in 198 patients who underwent PPV for idiopathic ERM. They recommended antiglaucomatous therapy for SIOPE. Akdere et al. (22) defined glaucoma as an IOP of >21 mm Hg and/or >4 mmHg higher than the preoperative IOP or fellow eye recorded in 2 visits and declined glaucoma onset as 43% after PPV in 107 patients. In our study, we accepted an IOP of ≥21 mmHg and/or ≥6 mmHg higher than the preoperative IOP or the addition of a new IOP-lowering drug as SIOPE (17). Within 1 year of follow-up, 37% of the vitrectomized and 2% of the fellow eyes were diagnosed with SIOPE.

Lalezary et al. (11) and Wu et al. (15) did not report a significant difference between the preoperative IOP and IOP at the final follow-up performed after the 12th month. Akdere et al. (22) found that the mean IOP of vitrectomized eyes was higher than the preoperative value in a 1-year follow-up study, but without statistical significance. We also found that the IOP of vitrectomized eyes was significantly higher than the preoperative value IOP at the 1st, 6th, and 12th months.

Chang et al. (2) analyzed the mean IOP measured during 3 consecutive visits and reported that the IOP of the vitrectomized eye was significantly higher than that of the other eye >15 months after PPV (19.5±2.7 mmHg vs 14.3±3.0 mmHg; p<0.0001). Lalezary et al. (15) and Wu et al. (11) reported that there was no significant difference in the IOP between the 2 eyes at a last follow-up visit at least 12 months after PPV. Tognetto et al. (21) reported a significant difference in the IOP of treated and fellow untreated eyes 30 days after surgery, which gradually resolved to an insignificant difference within 26 months. Aykut et al. (7) studied IOP changes after PPV performed for rhegmatogenous retinal detachment and observed similar IOP values at a 12-month follow-up; however, they noted that the number of glaucoma medications needed postoperatively was significantly higher in the treated eye. Lee et al. (18) reported no significant difference in IOP between the eyes of 198 patients in a sin-

gle-slice measurement performed 4-140 months after PPV. Tognetto et al. (21) investigated long-term IOP in 368 eyes who underwent PPV for idiopathic ERM with 23-G, 25-G and 27-G instruments. All of the cases in that study were unilateral and the fellow eyes were used as a control group. The authors reported that the incidence of IOP ≥22 mmHg or >4 mmHg from the baseline value at the final visit was similar in both groups (5.7% in both). Govetto at al. (16) compared the vitrectomized (20-G) and non-vitrectomized eyes of 156 patients and found that the prevalence of OAG in vitrectomized eyes was significantly greater using the vertical cup/disc ratio and retina nerve fiber layer thickness for the diagnosis of OAG. In our study, the IOP of the vitrectomized eye was significantly higher than that of the fellow eye at the 1st, 6th, and 12th months. The length of time after the procedure, the diversity of surgical indications, the gauge of the instruments, and the definition of OH and glaucoma used may explain differing results.

Fang et al. (14) defined OH as an IOP of ≥30 mmHg in the first 24 hours, ≥25 mmHg in the first 6 weeks, and 22 mmHg afterward, and started antiglaucomatous treatment based on these findings. They noted that 68% of the IOP elevation occurred in the first month. We also observed the highest IOP values in the first month after PPV.

Postoperative IOP reduction, especially on the first postoperative day, is another issue to consider when evaluating IOP changes. Charles et al. (8) compared 23-G and 27-G instruments and found a significantly lower IOP in the 23-G group. In our study, we compared 20-G and 23-G instruments and observed an IOP decrease in the 23-G group, indicating that wound leakage may be a result of sclerotomies left unsutured in the 23-G group.

The literature findings regarding IOP elevation following a lensectomy vary (2-4, 21). Our results revealed no significant difference in SIOPE between phakic and pseudophakic eyes (36% and 39%, respectively).

It has been postulated that a combined phacovitrectomy may be associated with a higher postoperative IOP than PPV alone (4). We did not find any significant difference in SIOPE between phaco-PPV and PPV procedures (36% vs 40%, respectively). The use of 20-G and 23-G instruments and the diversity of surgical indications may be the reason for different results.

It has been reported that the use of a tamponade, particularly silicone and C3F8, may increase the risk of postoperative IOP elevation (14, 22-24). We did not find any relationship between tamponade use and SIOPE, however we excluded silicone tamponade cases and C3F8 was used only in 1 case.

Interpretation of the results of this study is limited by the small number of patients, the heterogeneity of etiologies, and the nonrandomized, retrospective design. IOP measurement was not standardized (performed preoperatively with Tono-Pen and Goldmann applanation tonometry on subsequent examinations), and no photographic or OCT images of the optic nerve were available. Multicenter observational research of SIOPE and its effects on glaucomatous damage of the optic nerve in homogenous groups would be valuable.

Despite some variability in study populations, definitions, and reporting, the current literature suggests a greater risk of developing OAG and OHT after a vitrectomy in comparison with the fellow eye (25).

In conclusion, the IOP may rise significantly even after an uncomplicated PPV compared with that of the fellow eye or the preoperative IOP. SIOPE, and preoperative IOP values should be taken into consideration in PPV evaluation, in addition to cross-sectional IOP measurements.

Disclosures

Acknowledgments: The authors would like to thank Prof. Dr. Sedat Ziyade for assistance with the statistical analysis and all of our teachers and colleagues for their very valuable support.

Ethics Committee Approval: The study was approved by the ethics committee of Bezmialem Valide Sultan Foundation for the Poor Training and Research Hospital on August 19, 2009 (No: 8/3).

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Involved in design and conduct of the study (OC, KSC); preparation and review of the study (KSC); data collection (KSC); and statistical analysis (SZ, KSC).

References

1. Muether PS, Hoerster R, Kirchhof B, Fauser S. Course of intraocular pressure after vitreoretinal surgery: Is early postoperative intraocular pressure elevation predictable? Retina 2011;31:1545–52.
2. Chang S. LXII Edward Jackson lecture: open angle glaucoma after vitrectomy. Am J Ophthalmol 2006;141:1033–43.
3. Luk FOJ, Kwok AKH, Lai TYY, Lam DSC. Presence of crystalline lens as a protective factor for the late development of open angle glaucoma after vitrectomy. Retina 2009;29:218–24.
4. Yang HK, Woo SJ, Park KH, Park KH. Intraocular pressure changes after vitrectomy with and without combined phacoemulsification and intraocular lens implantation. Korean J Ophthalmol 2010;24:341–6.
5. Costarides AP, Alabata P, Bergstrom C. Elevated intraocular pressure following vitreoretinal surgery. Ophthalmol Clin North Am 2004;17:507–12, v.
6. Kovacic H, Wolfs RCW, Klllç E, Ramdas WD. The effect of multiple vitrectomies and its indications on intraocular pressure. BMC Ophthalmol 2019;19:1–7.
7. Aykut V, Esen F, Oğuz H. Intraocular Pressure Changes After Pars Plana Vitrectomy for Rhegmatogenous Retinal Detach-

ment. J Retin Vitr 2020;29:15–9.
8. Charles S, Ho AC, Dugel PU, Riemann CD, Berrocal MH, Gupta S, et al. Clinical comparison of 27-gauge and 23-gauge instruments on the outcomes of pars plana vitrectomy surgery for the treatment of vitreoretinal diseases. Curr Opin Ophthalmol 2020;31:185–91.
9. Turgut B, Çalış Karanfil F. Vitreoretinal girişimlerden sonra göz içi basınç artışı ve glokom. Available at: https://www.todnet.org/glokom/Vitreoretinal.htm. Accessed May 27, 2021.
10. Tranos P, Asaria R, Aylward W, Sullivan P, Franks W. Long term outcome of secondary glaucoma following vitreoretinal surgery. Br J Ophthalmol 2004;88:341–3.
11. Wu L, Berrocal MH, Rodriguez FJ, Maia M, Morales-Canton V, Figueroa M, et al. Intraocular Pressure Elevation After Uncomplicated Pars Plana Vitrectomy. Retina 2014;34:1985–9.
12. Koreen L, Yoshida N, Escariao P, Niziol LM, Koreen I V., Musch DC, et al. Incidence of, risk factors for, and combined mechanism of late-onset open-angle glaucoma after vitrectomy. Retina 2012;32:160–7.
13. Yu AL, Brummeisl W, Schaumberger M, Kampik A, Welge-Lussen U. Vitrectomy does not increase the risk of open-angle glaucoma or ocular hypertension--a 5-year follow-up. Graefe's Arch Clin Exp Ophthalmol = Albr von Graefes Arch fur Klin und Exp Ophthalmol 2010;248:1407–14.
14. Fang Y, Long Q, Wang X, Jiang R, Sun X. Intraocular pressure 1 year after vitrectomy in eyes without a history of glaucoma or ocular hypertension. Clin Ophthalmol 2017;11:2091–7.
15. Lalezary M, Kim SJ, Jiramongkolchai K, Recchia FM, Agarwal A, Sternberg P. Long-term trends in intraocular pressure after pars plana vitrectomy. Retina 2011;31:679–85.
16. Govetto A, Domínguez R, Landaluce ML, Álves MT, Lorente R. Prevalence of open angle glaucoma in vitrectomized eyes: A cross-sectional study. Retina 2014;34:1623–9.
17. Sternfeld A, Ehrlich R, Weinberger D, Dotan A. Effect of different lens status on intraocular pressure elevation in patients treated with anti-vascular endothelial growth factor injections. Int J Ophthalmol 2020;13:79–84.
18. Hoang Q, Tsuang A, Gelman R, Mendonca L, Della Torre K, Jung J, et al. Clinical predictors of sustained intraocular pressure elevation due to intravitreal anti-vascular endothelial growth factor therapy. Retina 2013;33:179–87.
19. Vo Kim S, Fajnkuchen F, Sarda V, Qu-Knafo L, Bodaghi B, Giocanti-Aurégan A. Sustained intraocular pressure elevation in eyes treated with intravitreal injections of anti-vascular endothelial growth factor for diabetic macular edema in a real-life setting. Graefe's Arch Clin Exp Ophthalmol 2017;255:2165–71.
20. Yannuzzi NA, Patel SN, Bhavsar K V, Sugiguchi F, Freund KB. Predictors of sustained intraocular pressure elevation in eyes receiving intravitreal anti-vascular endothelial growth factor therapy. Am J Ophthalmol 2014;158:319-27.e2.
21. Tognetto D, Pastore MR, Cirigliano G, D'Aloisio R, Borelli M, De Giacinto C. Long-term intraocular pressure after uncomplicated pars plana vitrectomy for idiopathic epiretinal membrane. Retina 2019;39:163–71.
22. Akdere Özener B, Yücel İ, Yardımsever M, Kaya Hüseyinoğlu B. Intraocular pressure elevation following pars plana vitrectomy and treatment methods. Turkiye Klin J Ophthalmol 2020;29:44–51.
23. Brosh K, Strassman I, Seelenfreund M. High intraocular pressure in four vitrectomized eyes with intravitreal C3F8 without high altitude travel. Eye (Lond) 2014;28:892–4.
24. Kanclerz P, Grzybowski A. Complications associated with the use of expandable gases in vitrectomy. J Ophthalmol 2018;2018:8606494.
25. Miele A, Govetto A, Fumagalli C, Donati S, Biagini I, Azzolini C, et al. Ocular hypertension and glaucoma following vitrectomy: A systematic review. Retina 2018;38:1–8.