

Research Article

Epidemiological and Clinical Profiles of Infectious Endophthalmitis: A Comparative Study of Traumatic and Non-Traumatic Aetiologies in a Tertiary Eye Care Center in Rural Tribal Areas of Western India

Mehul Shah¹, Shreya Shah^{1*}, Vedant Rajoria¹, Riddhi Shah¹, Raj Vador¹, Nikita Balani¹

¹Drashti Netralaya, Dahod, Gujarat, India

*Correspondence author: Shreya Shah, Drashti Netralaya, Dahod, Gujarat, India; Email: omtrustdahod@gmail.com

Citation: Shah M, et al. Epidemiological and Clinical Profiles of Infectious Endophthalmitis: A Comparative Study of Traumatic and Non-Traumatic Aetiologies in a Tertiary Eye Care Center in Rural Tribal Areas of Western India. J Ophthalmol Adv Res. 2025;6(1):1-7. <https://doi.org/10.46889/JOAR.2025.6107>

Received Date: 14-03-2025

Accepted Date: 07-04-2025

Published Date: 14-04-2025



Copyright: © 2025 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CCBY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract

Introduction: Infectious endophthalmitis is a rare but severe condition that can result in significant vision loss, requiring urgent medical intervention. This study aims to analyze and compare the epidemiological, clinical and microbiological profiles of patients diagnosed with infectious endophthalmitis, with a particular focus on the differences between traumatic and non-traumatic cases. The research was conducted at a tertiary eye care facility serving rural tribal communities in western India.

Methods: A retrospective review was performed using electronic medical records of patients diagnosed with endophthalmitis between January 2008 and December 2022. The treatment approach included the administration of an initial intravitreal injection and/or 23-gauge pars plana vitrectomy. All patients followed a standardized post-treatment monitoring schedule. The collected data were compiled in an Excel sheet and analyzed using SPSS-22. Descriptive and cross-tabulation analyses were performed and there were no financial disclosures associated with this study.

Results: The study included 200 patients, with 89 (45.5%) diagnosed with non-traumatic Post-Operative (PO) endophthalmitis and 111 (55.5%) with Post-Traumatic (PT) endophthalmitis. The majority of patients in both groups were male, with the PT group consisting of significantly younger individuals compared to the PO group.

At the time of presentation, 94.2% of patients had a Best-Corrected Visual Acuity (BCVA) below 1/60. Treatment outcomes varied depending on the underlying cause, with 46 eyes (23%) improving to a BCVA of 6/60 and 29 eyes (14.5%) achieving a BCVA better than 6/24. Additionally, 22 patients (11%) had no perception of light. Statistical analysis showed no significant difference in visual outcomes between traumatic and non-traumatic cases ($p=0.278$).

Conclusion: Although infectious endophthalmitis is uncommon, it has the potential to cause severe vision impairment. Prompt and aggressive treatment was associated with substantial

visual improvement. However, this study did not find a significant correlation between the underlying cause and treatment outcomes. Early diagnosis and appropriate management remain critical for optimizing visual prognosis in patients with infectious endophthalmitis.

Keywords: Endophthalmitis; Post Trauma Endophthalmitis; Post Operative Endophthalmitis; Comparative; Visual Outcome

Introduction

Endophthalmitis caused by open-globe ocular trauma generally carries a worse visual prognosis compared to its postsurgical counterpart. Several factors contribute to this difference, including the virulence of the causative microorganisms, the extent of ocular damage, the timeliness of diagnosis and the effectiveness of treatment. The use of intravitreal antibiotics and vitrectomy has demonstrated positive outcomes in both experimental and clinical cases, particularly in specific situations [1,2]. To better

understand the factors influencing the prognosis of traumatic versus Postoperative (PO) endophthalmitis (Fig. 1), we conducted a retrospective analysis of 50 cases of exogenous endophthalmitis (Fig. 2) [3,4].

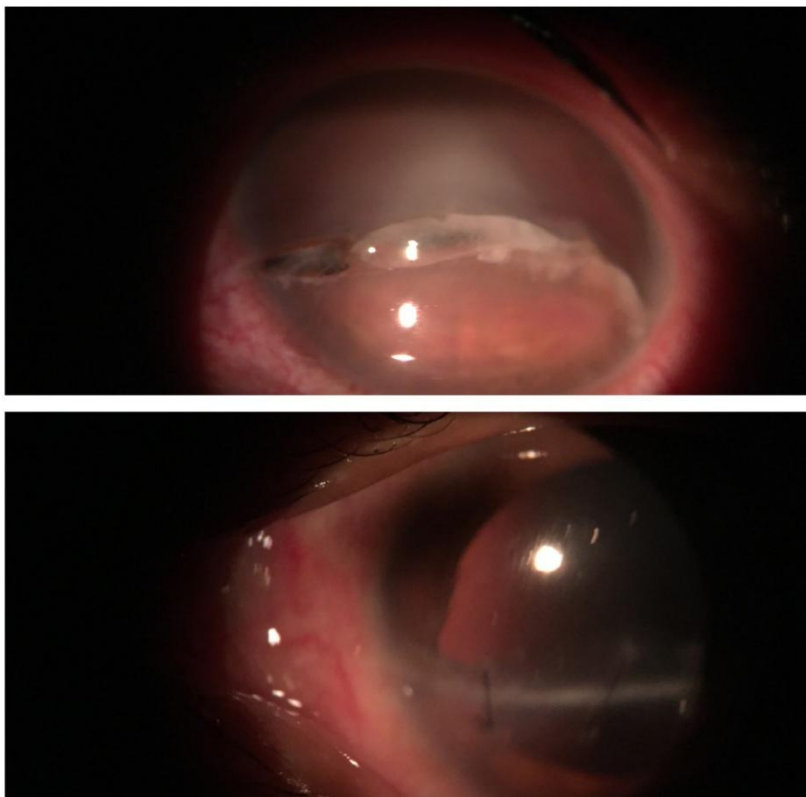


Figure 1: Pre and Post treatment.

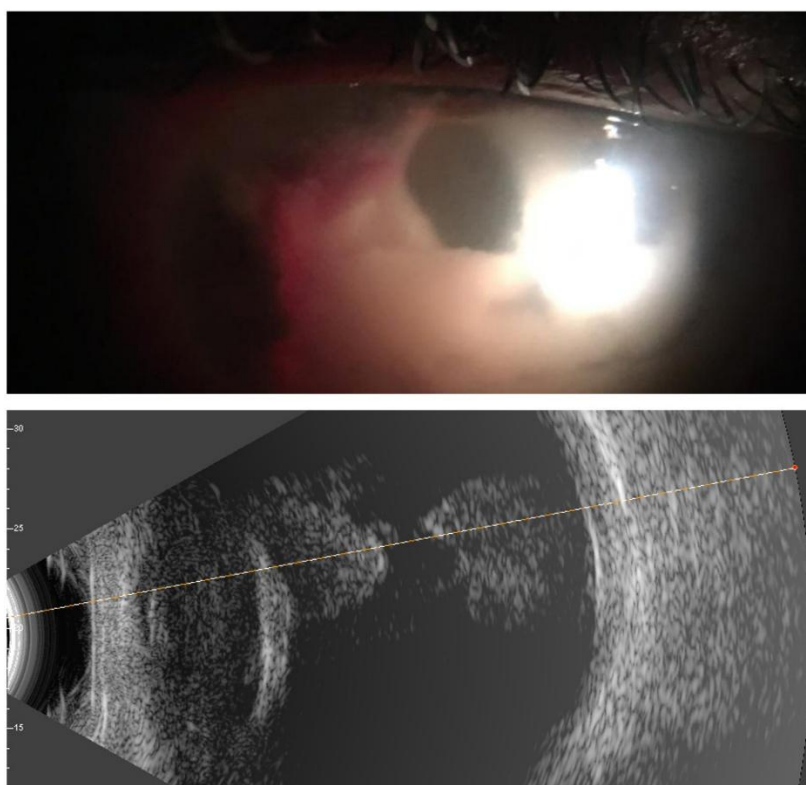


Figure 2: Presentation and USG.

Material and Methods

This study received approval from the Institutional Review Board (IRB) of XXX, which also waived the requirement for informed consent. The research adhered to the ethical principles outlined in the Declaration of Helsinki.

A retrospective analysis was conducted on all cases of endophthalmitis diagnosed and treated between January 2008 and December 2020, with a minimum follow-up period of 30 days. The study included patients with exogenous endophthalmitis who presented at Drashti Netralaya from January 2008 to December 2021. Cases were identified based on a history of ocular trauma or surgery, along with clinical signs such as eye pain, reduced visual acuity, conjunctival chemosis, hyperemia and inflammation of the anterior chamber or vitreous [5-8].

Treatment was guided by the Endophthalmitis Vitrectomy Study (EVS) recommendations, incorporating vitrectomy and intravitreal antibiotics in specific cases. These interventions were primarily considered for patients with severe visual impairment (light perception or worse, hand motion vision below grade 7) and significant vitreous inflammation suggestive of infection. Standard intravitreal antibiotic therapy consisted of vancomycin and ceftazidime. Additionally, B-scan ultrasonography was routinely utilized to monitor disease progression and assist in vitrectomy planning. In cases where patients experienced severe pain and complete vision loss, primary enucleation or evisceration was performed. The study defined successful treatment outcomes as achieving a visual acuity of 3/60 or better.

Results

The study included 200 eyes, with 111 cases (55.5%) resulting from trauma and 89 cases (44.5%) following ocular surgery. Among the patients, 122 (61%) were male and 78 (39%) were female, with a median age of 45 years (range: 1-84).

A total of 46 patients (23%) attained a final visual acuity of $\geq 6/60$, while 29 (14.5%) achieved a visual acuity of $> 6/24$. A statistically significant improvement in visual acuity was observed when comparing pre- and post-treatment outcomes ($p=0.000$). However, no significant difference was found when comparing visual outcomes between traumatic and non-traumatic cases ($p=0.278$, Table 2). The overall success rate for exogenous endophthalmitis cases in this study was 23%, with a success rate of 17.13% in Post-Traumatic (PT) cases and 30.3% in Postoperative (PO) cases [7-10].

Various factors were analyzed and compared between both etiologies. A key observation was that surgical intervention led to better visual outcomes in non-traumatic cases. Additionally, pediatric cases were rare in the non-traumatic group, whereas traumatic pediatric cases had poorer visual prognoses (Table 1, Fig. 3,4) [11-16].

Variable	Non-Traumatic		Post Traumatic		Total	
	No	%	No	%	No	%
Demography						
No	89	45.5	111	55.5	200	100
Age Median	60	---	25	---	45	--
Female	35	39.3	37	33.3	78	39
Male	54	60.7	74	67.4	122	61
Pediatric	4	4.5	46	41.4	50	25
Interval Event and Presentation (Median)	7	--	5	--	6	--
Interval Event and Intervention (Median)	4	--	9	---	7	--
Treatment						
Medical Treatment	40	44.9	27	24.3	66	33
Number of Injections(Mean)	1.46	--	1.13	--	1.28	
Number of Surgeries(Mean)	0.56	--	0.95	--	1.08	
Surgical Treatment	49	55.1	84	75.7	134	67
Destructive Procedure	3	3.4	3	2.7		

Pre Treatment Vision						
Nopl	3	3.4	17	15.9	20	10
Plpr-Hm	66	74.2	77	69.4	143	71.5
Fcnf-3/60	14	15.7	13	11.7	27	13.5
>6/60	6	6.7	4	3.6	10	5
Post Treatment Vision						
Nopl	9	10.1	13	11.7	22	11
Plpr-Hm	34	38.2	48	43.2	41	52
Fcnf-3/60	12	13.5	21	18.9	33	16.5
>6/60	27	30.3	19	17.1	46	23
Lf	7	7.9	10	9	17	8.5
Comparative Study of Other Variables-P Value						
Pre Treatment Vision	0.112		0.000		0.000	
Traumatic Vs Non-Traumatic	---		---		0.315	
Number Of Injections	0.132		0.945		0.993	
Medical Vs Surgical Intervention	0.02		0.365		0.091	
Pediatric Vs Adult	0.801		0.005		0.001	
Visoual Outcome Vs Age	0.326		0.075		0.002	
Nopl	0.660		0.059		0.660	
Type Of Injury	---		0.328		--	
Object Of Injury	---		0.236		--	
Previous Surgery	0.002		--		--	

Table 1: Comparative study of traumatic and non-traumatic infections endophthalmitis.

Vision Category		Category		TOTAL
		Traumatic	Non-Traumatic	
	Jan-60	3	5	8
	Feb-60	3	1	4
	Mar-60	3	3	6
	06-Dec	5	4	9
	Jun-18	5	2	7
	Jun-24	2	5	7
	Jun-36	5	6	11
	Jun-60	2	5	7
	06-Sep	2	6	8
	FCNF	11	4	15
	HM	21	15	36
	LF	1	3	4
	NOPL	18	10	28
	PLPR	30	20	50
	Total	111	89	200

Table 2: Comparative study of visual outcome in traumatic and non-traumatic categories.

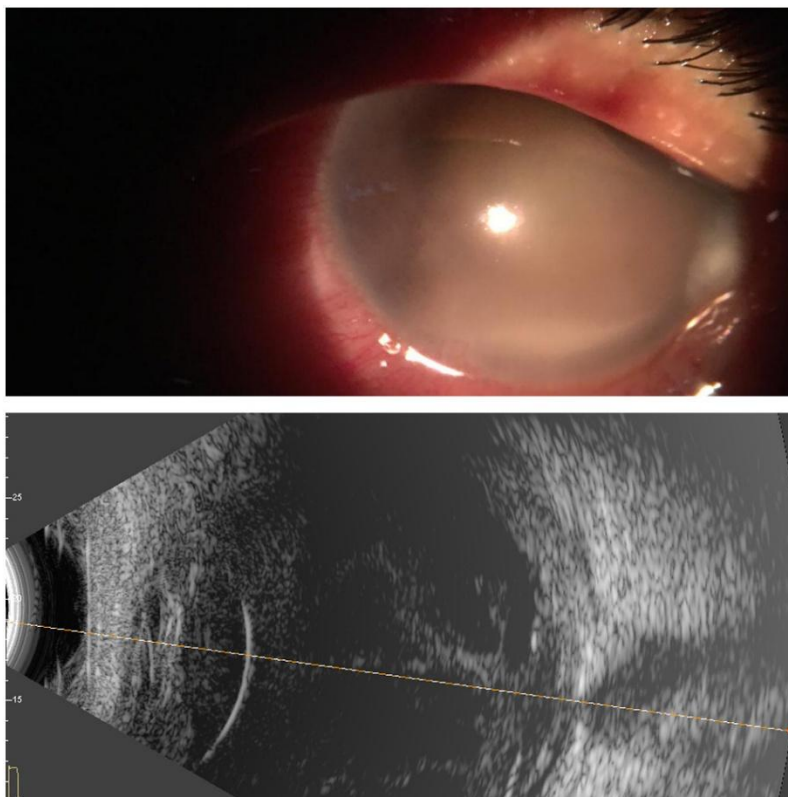


Figure 3: Presentation post trauma endophthalmitis.

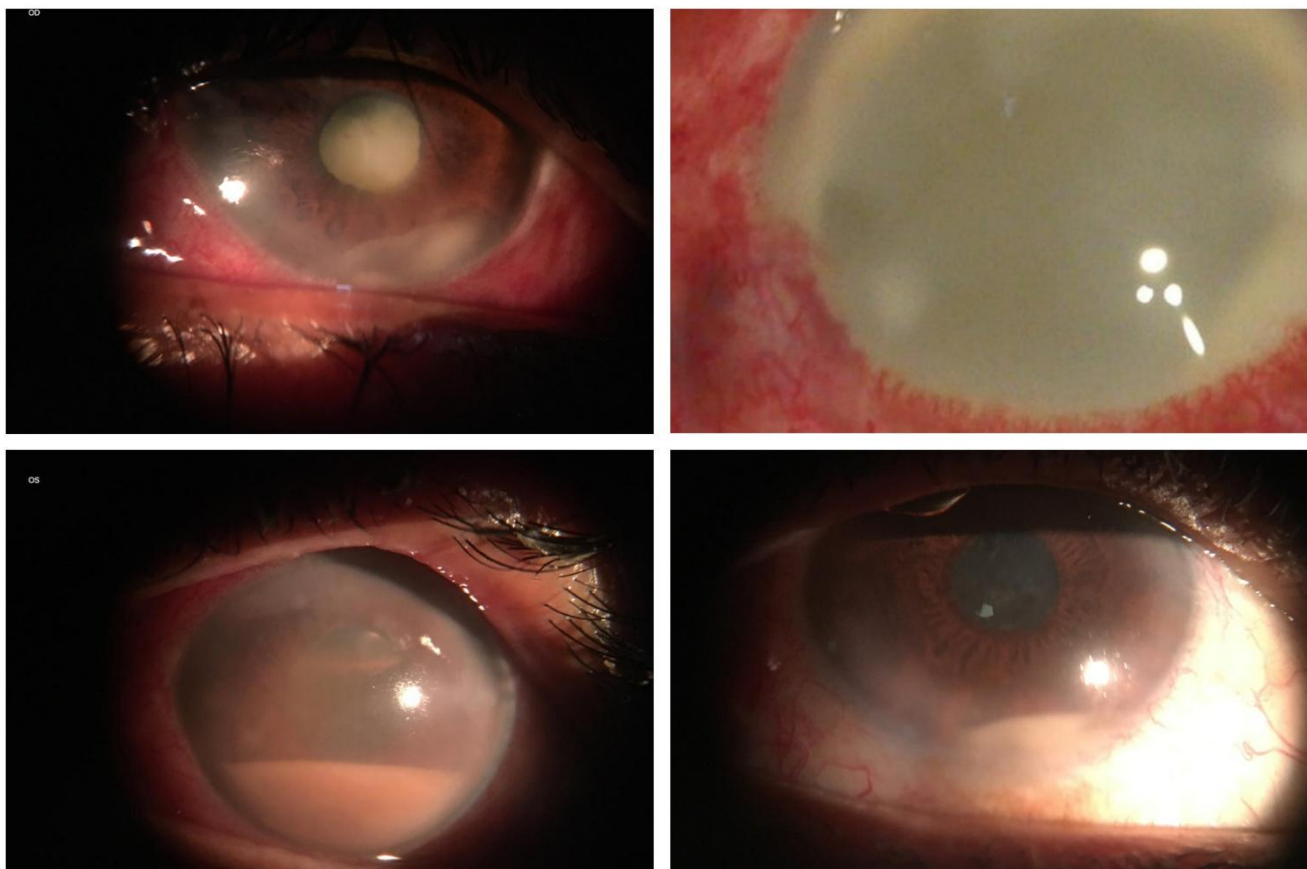


Figure 4: Different clinical pictures.

Discussion

This retrospective study examined 200 consecutive cases of exogenous endophthalmitis treated between 2008 and 2022. The findings indicated that patients in the non-traumatic group who underwent vitrectomy for endophthalmitis had better visual outcomes than those who received medical treatment alone [14].

According to the Endophthalmitis Vitrectomy Study (EVS) guidelines, vitrectomy combined with Intravitreal Antibiotics (IOAB) is an effective treatment option for cases with severe vitreous involvement, regardless of the underlying cause. The overall success rate for exogenous endophthalmitis cases treated after 1977 has been reported at 27.2%, which aligns with recent case series.

The success rates for Posttraumatic (PT) endophthalmitis showed significant variability, ranging from 17% to 83%. In this study, a success rate of 17.1% was observed in 111 PT cases, while 33% of the 84 patients who underwent vitrectomy with IOAB achieved favorable visual outcomes. Several factors influence the prognosis of PT endophthalmitis, including the severity of the initial injury, the time elapsed before treatment and the virulence of the causative microorganisms. These elements likely contribute to the diverse visual outcomes reported in different studies [15].

In contrast, success rates for Postoperative (PO) endophthalmitis have remained relatively consistent across various reports. PO cases typically involve anterior segment procedures and benefit from close postoperative monitoring. In this study, vitrectomy combined with IOAB resulted in a 32.1% success rate for PO endophthalmitis. No significant difference was found between the treatment outcomes of PT and PO endophthalmitis (Tables 1,2).

Lower visual outcomes in previous research may be attributed to additional comorbid conditions, which were also observed in this study. In addition to the immediate and long-term effects of ocular trauma, delayed medical intervention in PT endophthalmitis cases may contribute to poorer prognoses compared to PO cases. Furthermore, PT infections are often polymicrobial. Rowsey, et al., reported a higher incidence of mixed infections in PT cases compared to PO endophthalmitis and some studies suggest that infections caused by multiple organisms may lead to more severe visual impairment than those caused by a single pathogen [15,16].

Conclusion

Although infectious endophthalmitis is relatively uncommon, it poses a significant risk of vision impairment. Early diagnosis and timely intervention are crucial in improving visual outcomes. While this study did not establish a clear correlation between the underlying cause and treatment efficacy, prompt identification and appropriate management remain essential for achieving better prognoses in patients with infectious endophthalmitis.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding Details

No funding was received for this review. No other financial disclosures of all authors.

References

1. Nobe JR, Gomez DS, Liggett P, Smith RE, Robin JB. Post-traumatic and postoperative endophthalmitis: a comparison of visual outcomes. *British J Ophthalmology*. 1987;71(8):614-7.
2. Durrani AF, Zhao PY, Zhou Y, Huvard M, Azzouz L, Keil JM, et al. Risk factors for endophthalmitis following open globe injuries: A 17-year analysis. *Clinical Ophthalmology*. 2021;2077-87.
3. Andreoli CM, Andreoli MT, Kloeck CE, Ahuero AE, Vavvas D, Durand ML. Low rate of endophthalmitis in a large series of open globe injuries. *Am J Ophthalmology*. 2009;147(4):601-8.
4. Brinton GS, Topping TM, Hyndiuk RA, Aaberg TM, Reese FH. Posttraumatic endophthalmitis. *Arch Ophthalmol* 1984;102:547-50.
5. Puliafito CA, Baker AS, Haaf J, Foster CS. Infectious endophthalmitis: Review of 36 cases. *Ophthalmol*. 1982;89:921
6. Peyman GA, Carroll CP, Raichand M. Prevention and management of traumatic endophthalmitis. *Ophthalmol*. 1980;87:320-
<https://doi.org/10.46889/JOAR.2025.6107>
<https://athinaeumpub.com/journal-of-ophthalmology-and-advance-research/>

- 4.
7. Vitrectomy E. Results of the endophthalmitis vitrectomy study. *Arch Ophthalmol*. 1995;113:1479-96.
8. Forster RK, Abbott RL, Gelender H. Management of infectious endophthalmitis. *Ophthalmol*. 1980;87:313-9.
9. Peyman GA, Raichand M, Bennett TO. Management of endophthalmitis with pars plana vitrectomy. *Br J Ophthalmol* 1980;64: 472-5.
10. Banker TP, McClellan AJ, Wilson BD. Culture-positive endophthalmitis after open globe injuries with and without retained intraocular foreign bodies. *Ophthalmic Surg Lasers Imaging Retina*. 2017;48(8):632-7.
11. Verbraeken H, Rysselaere M. Post-traumatic endophthalmitis. *Eur J Ophthalmol*. 1994;4:1-5.
12. Faghihi H, Hajizadeh F, Esfahani MR. Posttraumatic endophthalmitis: Report no. 2. *Retina*. 2012;32(1):146-51.
13. Rowsey JJ, Newsom DL, Sexton DJ, Harms WK. Endophthalmitis: Current approaches. *Ophthalmology*. 1982;89(9):1055-66.
14. Essex RW, Yi Q, Charles PGP, Allen PJ. Post-traumatic endophthalmitis. *Ophthalmol*. 2004;111(11):2015-22.
15. Thompson JT, Parver LM, Enger CL, Mieler WF, Liggett PE. Infectious endophthalmitis after penetrating injuries with retained intraocular foreign bodies. National Eye Trauma System. *Ophthalmol*. 1993;100(10):1468-74.
16. Zhang Y, Zhang MN, Jiang CH, Yao Y, Zhang K. Endophthalmitis following open globe injury. *Br J Ophthalmol*. 2010;94(1):111-4.

Journal of Ophthalmology and Advance Research



Publish your work in this journal

Journal of Ophthalmology and Advance Research is an international, peer-reviewed, open access journal publishing original research, reports, editorials, reviews and commentaries. All aspects of eye care health maintenance, preventative measures and disease treatment interventions are addressed within the journal. Ophthalmologists and other researchers are invited to submit their work in the journal. The manuscript submission system is online and journal follows a fair peer-review practices.

Submit your manuscript here: <https://athenaeumpub.com/submit-manuscript/>