

A Retrospective Study of Clinico-Microbiological Profile of Post-Traumatic Endophthalmitis Cases Treated at A Tertiary Care Centre in Rajasthan

Ashu Agarwal^{1*}, Daksh Sharma², Kamlesh Khilnani³

^{1*}MS DNB FICO, Assistant Professor, Department of Ophthalmology, SMS Medical College, Jaipur

² Resident Doctor, Department of Ophthalmology, SMS Medical College, Jaipur

³ MS Senior Professor, Department of Ophthalmology, SMS Medical College, Jaipur

Received: 06-03-2021 / Revised: 05-04-2021 / Accepted: 25-04-2021

Corresponding author: Dr Ashu Agarwal

Conflict of interest: Nil

Abstract

Purpose: The purpose of this study is to evaluate the clinical and microbiological profile of patients presenting with post-traumatic endophthalmitis to a tertiary care centre in Rajasthan.

Methods: A Retrospective chart review of consecutive cases with endophthalmitis presenting to vitreoretinal facility of tertiary care centre of Rajasthan from January 2019 to January 2020 and studying their clinico-microbiological profile.

Results: The study included 43 patients where the mean age of the sample was 37.8 years (SD=24.1). The majority of patients were males 36 (83.7%) and with predominant left eye involvement 30 (69.7%). Majority of patients had PL only vision, 23.35% of patients had vision greater than perception of light. At presentation majority of patients were phakic (60.4%) in which traumatic cataract was seen in 25.6% of patients. About 90.6% underwent pars plana vitrectomy with intravitreal antibiotics. Oil tamponade was used in 70% of patients who underwent Pars Plana Vitrectomy. The microbiological analysis of vitreous fluid revealed a predominance of gram negative bacilli (51.1%), gram positive cocci (13.9%) and fungi (13.9%).

Conclusions: More than 3/4th of post-traumatic endophthalmitis patients at our centre had PL only vision. Majority of these patients had to undergo pars plana vitrectomy. Most commonly found organism on microbiological profile was gram negative bacilli.

Keywords: Endophthalmitis, India, Vitrectomy

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Endophthalmitis is intraocular infection affecting inner coats of the eye with progressive vitreous inflammation [1]. It is the most dreaded and devastating ocular

complication with a potential to lead to permanent and profound loss of vision [2]. The exogenous infective endophthalmitis occurs either after intraocular surgery or trauma and the endogenous endophthalmitis is

usually the result of haematogenous spread of organisms to the eye from a site of infection elsewhere in the body or from contaminated catheters or needles [3]. The aim was to analyze the clinical and microbiological data of patients who were clinically diagnosed as post-traumatic endophthalmitis on presentation[4]. Apart from these the treatment profile and outcome are also described in endophthalmitis patients.

Methods

Participants

A convenience sample was used to include all diagnosed cases of endophthalmitis treated at vitreo-retinal service of a tertiary care centre in Rajasthan over a period one year from 2019-20.

Procedure

Medical records were reviewed and these patients were followed up for 6 weeks to assess the outcome. All patients underwent a diagnostic work-up and were provided appropriate treatment for management of endophthalmitis.

Ethical statement

An approval from institute ethical committee was obtained, in accordance with the Declaration of Helsinki. Informed consent was taken from all patients for use of their medical records for purpose of research and they were assured of confidentiality.

Statistical analysis

Data was coded in Microsoft Excel and all statistical calculations for descriptive statistics were done in it.

Results

The study included 43 patients where the mean age of the sample was 37.8 years (SD=24.1). The majority of patients were males 36 (83.7%) and with predominant left eye involvement 30 (69.7%). Majority of the patients had only perception of light (PL) [76.75%] and among these 56.4% had an accurate projection of rays (PR). The mean intra-ocular tension was 14.6 (SD=5.6).

At presentation the eye was phakic in 34.8%, pseudophakic in 30.2% and with traumatic cataract was seen in 25.6%. Majority of the patients (90.6%) underwent vitrectomy with intravitreal antibiotics. IOFB removal was done in 23.2%, tear repair was done in 20.9%. Oil tamponade was also used in 79% of the patients who underwent pars plana vitrectomy with or without retained intraocular foreign body removal. Finally, improved vision (better than vision at presentation) was seen in 22 i.e. 56.4% of the patients at 6 weeks. [Please refer to Table 1]. The microbiological analysis of vitreous sample revealed a predominance of gram negative bacilli (51.1%) overall, gram positive cocci (13.9%) and fungi (13.9%). In addition, a neutrophilic infiltrate was seen in 46.5% of the patients. [Please refer to Table 2]

Table 1: Clinical profile of patients with post-traumatic endophthalmitis

S No		Total (%)
1.	Number of patients	43
	Males	36 (83.7)
	Females	7 (16.3)
2.	Age	37.81(24.18)
3.	Eye involved	
	Left	30 (69.7)
	Right	13 (30.3)
5.	Vision at presentation	

	PL Negative	4 (9.3)
	PL Positive	39 (80.7)
	Among PL Positive	
	Accurate PR	22 (56.4)
	Inaccurate PR	17 (43.6)
	Among Accurate PR	
	HM	15 (68.1)
	FC	7 (31.9)
6.	Intra ocular tension (IOT)	
	Mean	14.66 (5.68)
7.	Lens	
	Phakic	15 (34.8)
	Pseudophakic	13 (30.2)
	Tr. Cataract	11 (25.6)
	Sec IOL	1(2.3)
	Subluxated Lens	1 (2.3)
	Lens	1 (2.3)
	Clear lens	1 (2.3)
8.	Operative procedure	
	None	4 (9.3)
	Yes	39 (80.7)
	Among those with operative procedure	
	Vitrectomy	39 (90.6)
	IOFB removal	10 (23.2)
	IV Antibiotics	26 (60.5)
	IOL explants	3 (6.9)
	Lenectomy	1 (2.3)
	Pupillary membrane removal	1 (2.3)
	SICS	9 (20.9)
	Tear repair	9 (20.9)
	Sealed tear	6 (13.9)
	Phaco	1 (2.3)
9.	Oil tamponade	24 (55.8)
10.	Improved vision at 6 weeks	22 (56.4)

Table 2: Microbiological profile of patients with endophthalmitis

S No		No of patients (%)
1.	Type of microorganism	
	Gram Negative Bacilli	22 (51.1)
	Gram Positive Cocci	6 (13.9)
	Fungi	6 (13.9)
2.	Type of cells	
	Neutrophil	20 (46.5)

Discussion

The current study aimed to describe the clinical and microbiological profile of consecutive patients being diagnosed and treated for post-traumatic endophthalmitis. Previously many studies have described incidence of endophthalmitis in various at risk groups like post cataract or post traumatic [5]. Many studies have also studied a specific type like endogenous endophthalmitis. But there are a few studies which have described a series of consecutive cases presenting for post-traumatic endophthalmitis at a tertiary referral centre in North West India.

The data presented here represents patients from various parts of Rajasthan and its neighbouring states like Haryana and some parts of Delhi And other areas in or around Jaipur district in Rajasthan. Majority of cases were males. The possible reasons can be that males are more involved in outdoor activities so chances of injury is more [6]. Also due to conservative socioeconomic situation in North west India , males are more likely to travel and seek treatment .

On microbiological analysis, the vitreous sample positive on culture for microorganisms was 46.5% and vitreous sample positive on gram staining but negative on culture was 19.7%. Studies in past have reported sample positivity higher than this [7]. A number of causes such as low microbial load, delay in processing the samples due outsourcing of samples to specialized labs , prior treatment with fortified or broad spectrum antibiotics , *etc.* might be the cause for low culture positivity. The vitreous biopsy samples of our cases were outsourced for microscopy and culture at a specialized lab outside hospital which might account for low microscopy and culture positivity in our series of patients. Polymerase chain reaction (PCR) which can detect microorganisms even in small and delayed samples [8] could not be

done due to low socioeconomic status of the patients and lack of in hospital specialized clinics for the same.

The Endophthalmitis Vitrectomy Study (EVS) [9] reported around 94 per cent Gram-positive cocci and 6 per cent Gram-negative bacilli in post-operative endophthalmitis. The Indian studies reported 10-54 per cent Gram-positive cocci, 26-42 per cent Gram-negative and 16-22 per cent fungal infection in post-operative endophthalmitis[10]. In post traumatic endophthalmitis most studies have reported polymicrobial infections [11]

In our study gram negative bacilli were predominant in patients with post-traumatic endophthalmitis, followed by gram positive cocci and fungi in very few cases. The dry weather of Rajasthan might be responsible for less fungal infections[12].

Majority of our patients had to undergo pars plana vitrectomy with oil tamponade due to poor vision and severe condition at presentation.

Conclusions

Major findings of our study indicate that majority of patients with post-traumatic endophthalmitis had perception of light only vision at presentation and had to undergo pars plana vitrectomy with intravitreal antibiotics. Most commonly found organism on microbiological profile was gram negative bacilli in all etiologies. An implication of the study would be that it would add to the epidemiological database and help in understanding clinico microbiological profile of patients of endophthalmitis in North West India. This would help in starting appropriate antibiotics empirically.

References

1. Durand M. L. Endophthalmitis. *Clinical Microbiology and Infection*, 19(3), 2013;227-234.

2. Sadiq, M. A., Hassan, M., Agarwal, A., Sarwar, S., Toufееq, S., Soliman, M. K., & Nguyen, Q. D. "Endogenous endophthalmitis: diagnosis, management, and prognosis". *Journal of Ophthalmic Inflammation and Infection*, 5(1),2015; 1-11.
3. Oguz, E., & Oguz, H. "Challenges in ocular infectious diseases and the evolution of anti-infective therapy". *Survey of Ophthalmology*, 49(6), 2004;617-618.
4. Sharma, S., Padhi, T. R., Basu, S., Kar, S., Roy, A., & Das, T. "Endophthalmitis patients seen in a tertiary eye care centre in Odisha: a clinico-microbiological analysis". *The Indian Journal of Medical Research*, 139(1), 2014;91.
5. Anand, A. R., Therese, K. L., & Madhavan, H. N. "Spectrum of aetiological agents of postoperative endophthalmitis and antibiotic susceptibility of bacterial isolates". *Indian Journal of Ophthalmology*, 48(2)2000; 123.
6. Gupta, A., Gupta, V., Gupta, A., Dogra, M. R., Pandav, S. S., Ray, P., & Chakraborty, A. "Spectrum and clinical profile of post cataract surgery endophthalmitis in North India". *Indian Journal of Ophthalmology*, 51(2),2003; 139-145.
7. Lalitha, P., Rajagopalan, J., Prakash, K., Ramasamy, K., Prajna, N. V., & Srinivasan, M. "Postcataract endophthalmitis in South India: incidence and outcome". *Ophthalmology*, 112(11), 2005; 1884-1889.
8. Vedantham, V., Nirmalan, P. K., Ramasamy, K., Prakash, K., & Namperumalsamy, P. "Clinico-microbiological profile and visual outcomes of post-traumatic endophthalmitis at a tertiary eye care center in South India". *Indian Journal of Ophthalmology*, 54(1), 2006;5-10.
9. Okhravi, N., Adamson, P., Carroll, N., Dunlop, A., Matheson, M. M., Towler, H. M., & Lightman, S. "PCR-based evidence of bacterial involvement in eyes with suspected intraocular infection". *Investigative Ophthalmology & Visual Science*, 41(11), 2000;3474-3479.
10. Endophthalmitis Vitrectomy Study Group. "A randomized trial of immediate vitrectomy and of intravenous antibiotics for the treatment of postoperative bacterial endophthalmitis". *Archives of Ophthalmology*, 113, 1995; 1479-1496.
11. Therese, K. L., Anand, A. R., & Madhavan, H. N. "Polymerase chain reaction in the diagnosis of bacterial endophthalmitis". *British Journal of Ophthalmology*, 82(9),1998;1078-1082.
12. Kunimoto, D. Y., Das, T., Sharma, S., Jalali, S., Majji, A. B., Gopinathan, U., ... & Endophthalmitis Research Group. Microbiologic spectrum and susceptibility of isolates: Part I. Postoperative endophthalmitis. *American Journal of Ophthalmology*, 128(2),1999; 240-242.