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A 3-Year Retrospective Analysis of Endophthalmitis Incidence in the Intra-Vitreous Antiangiogenic Application Program (PAAI) for the treatment of Age-Related Macular Degeneration exudative form, Diabetic Macular Edema and Retinal Vein Occlusion

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INTRODUCTION

Since the advent of molecular therapeutics targeting vascular endothelial growth factor (VEGF) in the 2000s, intravitreal injections (IVI) have become one of the most common ophthalmologic procedures and they are used as a mainstay of treatment for a variety of retinal pathologies[1]. It is known that each injection of these agents carries an associated risk of endophthalmitis. Although the risk is low, endophthalmitis is a sight-threatening intraocular inflammation and, therefore, it remains one of the most feared complications[2].The main objective of this study is to determine, retrospectively, the incidence of endophthalmitis in the Intra-Vitreous Antiangiogenic Application Program (PAAI) at our institution.

MATERIALS AND METHODS

This study included patients enrolled in PAAI at Cassiano Antonio Moraes University Hospital (HUCAM), located in Vitória, Espírito Santo, Brazil. The Research Ethics Committee of HUCAM approved this study on April 26th, 2019 under registration number 01515718.7.0000.5071. HUCAM adopts a uniform protocol for IVI, which includes 5.45 mg/ml Moxifloxacin Hydrochloride, 0.5% Proparacaine instillation and 2.5% to 5% Povidone Iodine (PVI) eye drops applied in the preoperative holding area. In the operating room, all procedures comply with aseptic techniques. The Bevacizumab ampoule is opened shortly before the procedure and the solution is dispensed into 1 mL syringes. After periorbital antisepsis with 10% PVI and placement of the sterile lid speculum, the dose of Bevacizumab or Ranibizumab are injected using a 30-gauge needle, perpendicular to the sclera, between the vertical and horizontal rectus muscles 3.5 to 4.0 mm posterior to the limbus. In patients with history of PVI allergy, chlorhexidine is used in its place. After injection, Moxifloxacin Hydrochloride eye drops are instilled, followed by removal of the lid speculum. All patients undergoing anti-VEGF IVI for treatment of Age-Related Macular Degeneration exudative form (AMD), Diabetic Macular Edema (DME) and Retinal Vein Occlusions (RVO) from January 2016 to December 2019 were identified through PAAI records. The incidence of endophthalmitis was established per year and for the whole period of the study.

RESULTS

A total of 7,275 anti-VEGF IVI were performed by three retina specialists. Of the IVIs, bevacizumab was injected in 5,159 (70.91%) and ranibizumab in 2,116 (29.09%). From 2016 to 2019, 2 cases of endophthalmitis were reported, yielding an incidence rate of 0.027%. The incidence of endophthalmitis varied per year, with values fluctuating between 0 and 0.07% (Table 1). All two cases were culture negative by anterior chamber tap or vitreous biopsy and experienced partial recovery of vision after treatment.

Case 1

A 72-year-old man treated for branch retinal vein occlusion presented 5 days after an IVI of ranibizumab in his left eye with painful loss of vision. He had history of hypertension and chronic rhinosinusitis. Best-corrected visual was hand motion. Further examination revealed a red eye with hypopyon in the anterior chamber and 3+ cells in vitreous cavity. He underwent an immediate vitreous needle tap combined with an IVI of vancomycin 1.0 mg and amikacin 0.4 mg. Best-corrected visual acuity had improved to 20/40 after treatment.

Case 2

A 51-year-old man treated for diabetic macular edema presented 7 days after an IVI of bevacizumab in his right eye with painful loss of vision. He had history of hypertension and diabetes mellitus type 2. Best-corrected visual was hand motion. Further examination revealed a red eye with 2+ cells in the anterior chamber and vitreous cavity. He underwent an immediate vitreous needle tap combined with an IVI of vancomycin 1.0 mg and amikacin 0.4 mg, which was repeated a week later. Best-corrected visual acuity had improved to 20/200 after treatment.

Table 1: Presumed endophthalmitis incidence per year

Year	Incidence (%)
2017	0/2,280= 0.0 %
2018	2/2,709= 0.07%
2019	0/2,286=0.0%

DISCUSSION

This retrospective analysis of 7,275 IVIs of VEGF inhibitors performed in the sterile conditions in the operating room demonstrated a presumed endophthalmitis incidence of 0.027%. It was lower than incidences previously reported in the literature. The largest study to date evaluating endophthalmitis rates after anti-VEGF injection was the meta-analysis published by McCannel[3]. His analysis included both prospective and retrospective United States–based studies and found a total of 52 cases of endophthalmitis after 105,536 office based injections, yielding an incidence rate of 0.049% per injection (95% CI: 0.038–0.065%). Our study is limited by its retrospective nature and the difficulties inherent in studying the incidence of such a rare complication. Besides, because both cultures were negative, we cannot exclude that noninfectious injection-related inflammation was mistakenly attributed to infectious endophthalmitis.

CONCLUSION

Despite its limitations, this study appears to be one of the largest series to date in Brazil. Based on all these considerations, it can be concluded that the risk of endophthalmitis after IVI performed under the sterile conditions of the operating room in PAAI was very low.

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