

## Incidence of acute endophthalmitis after office based intravitreal bevacizumab injection

Muhammad Ali Haider,<sup>1</sup> Usman Imtiaz,<sup>2</sup> Farwah Javed,<sup>3</sup> Zahra Haider<sup>4</sup>

### Abstract

The burden of intravitreal injections has increased tremendously over the past few years. Since traditionally the operation theatre setup is currently used for this procedure, it is increasingly becoming difficult to manage such a patient load in the theatres. To overcome this challenge, office-based setup for intravitreal injection was started. This study was planned to determine the incidence of endophthalmitis after office-based intravitreal bevacizumab injection and to compare it with previously reported incidence of endophthalmitis after operation theatre-based intravitreal injections. The study was conducted at Al-Ehsan Eye Hospital, Lahore, Pakistan, from July 2015 to June 2016, and comprised patients who received intravitreal injections of bevacizumab (Avastin) for different ocular indications. A total of 1,047 intravitreal injections were given in an office-based set-up. Of them, 2(0.19%) cases of clinically suspected endophthalmitis were identified. Office-based set-up for intravitreal bevacizumab injection was found to have comparable safety profile with traditional operation theatre-based set-up.

**Keywords:** Bevacizumab, Endophthalmitis, Intravitreal injections.

### Introduction

The use of intravitreal injections has increased dramatically for various retinal pathologies since their introduction over the past decade.<sup>1</sup> New therapeutic agents and expanding indications have supplemented surgical and laser-based therapies.

The intravitreal agents and their administrative methods have evolved and safety profile has increased.

There has been a transition from operation theatres (OT) to office-based surgical set-ups as better understanding of the agents and administrative techniques have evolved. Office-based intravitreal therapy is now routinely performed as a set practice in

the developed countries to cater for increased patient load on the health services. Some studies have already been conducted comparing office-based and OT-based procedures.<sup>2</sup>

However, post-operative serious complications still remain a viable threat despite the evolution in the agents and administrative procedures. The incidence of infectious endophthalmitis after intravitreal injection varies from 0.02% to 0.16% in various retrospective trials.<sup>3</sup> In 2009, the Royal College of Ophthalmologists issued guidelines for intravitreal injections to be carried out either in operation theatre or in office-based settings to minimise the risk of endophthalmitis.<sup>4</sup>

The current study was planned to determine the incidence of infectious endophthalmitis after office-based intravitreal injections.

### Methods and Results

This prospective study was conducted at the retinal clinic of Al-Ehsan Eye Hospital, Lahore, Pakistan, from July 2015 to June 2016.

All patients who received intravitreal injections of bevacizumab (Avastin) for different ocular indications were included in the study.

Informed consent was taken from all the patients. All intravitreal injections in the study were performed in an especially designated office-based setting with nursing assistance.

The office-based setting included a small wash-up area for the surgeon and assistant, reclining chair for the patient, mayo trolley stand for the instruments and standard intravitreal injection instruments including eye speculum, verniercaliper and forceps.

All injections were performed by a vitreo-retinal consultant who had experience of working in vitreo-retinal clinics for the past 5 years.

A registered pharmacist formulated the injection preparation at Shaukat Khanum Memorial Hospital, Lahore and they were then delivered to the hospital.

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<sup>1,2</sup>Al-Ehsan Welfare Eye Hospital, <sup>3</sup>Lahore General Hospital, Lahore, <sup>4</sup>KRL Hospital, Islamabad, Pakistan.

**Correspondence:** Muhammad Ali Haider. Email: alihaider\_189@yahoo.com

The protocol of intravitreal injections at the clinic included pre-injection topical antibiotics and anaesthetic drops. The surgeon and nursing assistance used head caps, face masks and performed surgical hand scrub and wore sterile surgical gloves.

The eye was prepared for the injections with 5% povidone iodine drops in the conjunctival sac five minutes before injection. The lashes and eyelid skin were swabbed with 5% povidone iodine solution and were cleaned with alcohol swabs after five minutes.

The eyelids were draped with sterile drape and a sterile speculum was used. The injections were delivered preferably in the supero-temporal and infero-temporal quadrants, followed by drops of a topical antibiotic (moxifloxacin). Cartellaeye-shield was applied; patients were instructed to use antibiotic drops four times a day for five days.

Sterilisation protocol was the same for all participants.

Both fresh and re-injections were used. Patients were examined the next day for signs of endophthalmitis. We maintained a follow-up of 4 weeks after each intravitreal injection.

Endophthalmitis was a clinical diagnosis based on typical symptoms and signs, including pain, decreased visual acuity, conjunctival erythema, anterior chamber reaction, hypopyon and vitritis.

A total of 1,047 intravitreal injections of bevacizumab were performed. Of them, 2(0.19%) cases of clinically suspected endophthalmitis were identified based on the clinical findings of pain, redness, iritis, vitritis and decreased visual acuity.

Both these patients presented with symptoms of pain, red eye and decreased vision at the 2nd post-injection day. Visual acuity in involved eyes was reduced to 6/60 in both patients.

B-scan was performed to rule out retinal detachment after which the patients underwent intravitreal injections of vancomycin (1 mg/0.1 ml), ceftazidime (2.25 mg/0.1 ml) and dexamethasone (4 mg/0.1ml).

Both patients responded well to intravitreal therapy and vitrectomy was not required. Final visual acuity of 6/12 was achieved in both patients.

## **Discussion**

The main reason behind introducing the office-based set-up for the intravitreal injections was the increased patient load in current hospital-based settings.

This increased burden on the hospitals led to prolonged intervals between formulation of injections at source (in our case a registered pharmacist formulated the injection preparations at Shaukat Khanum Memorial Hospital Lahore), and their administration.

Moreover, at our hospital there was a waiting period for injection administration to the patients that was normally done after the main list was over.

To overcome these challenges a specially designed office-based setting was prepared. The surgeon and nursing team had been carrying out these procedures on a routine basis in the theatres and performed them in the newly designed set-up. The team was able to carry out the procedures with no limitations or difficulty. The procedures were performed on the same guidelines with minimal adaptation required and no learning curve for the consultants or fellows who have been carrying out these procedures before.

There is a low incidence of endophthalmitis after intravitreal injections.<sup>5</sup> Results of different previous studies have shown varying rates of endophthalmitis after intravitreal bevacizumab, ranging from 0.02% to 0.16%.<sup>6,3</sup> In our study, only 2(0.19%) patients developed endophthalmitis which is comparable to the international data. There should be a low threshold for diagnosing and treating clinical cases of endophthalmitis. Benefits of early diagnosis and treatment are documented by various clinical trials.

Risk factors for endophthalmitis post-intravitreal anti-vascular endothelial growth factor (anti-VEGF) have been studied in detail in various clinical trials. Evidence has shown that topical 5% povidine is most effective in reducing the incidence of infection post-intravitreal intervention; pre- and post-injection topical antibiotics do not alter the incidence.<sup>7</sup>

The use of a lid speculum and face mask has been suggested as a prevention strategy; however, different studies vary in their results regarding their efficacy.<sup>8</sup>

Commonest organisms implicated in the development of endophthalmitis post-cataract surgery are from patient's native flora and are coagulase-negative Staphylococcus and Staphylococcus aureus.<sup>9</sup>

Moreover, the use of povidine-iodine is pivotal in the prevention of endophthalmitis.

Better understanding of the risk factors can further help reduce the incidence of serious complications.

## Conclusion

Office based set-up for intravitreal bevacizumab injection had comparable safety profile with traditional operation theatre-based set-up.

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**Conflict of Interest:** None.

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