

SHORT COMMUNICATION

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Can bevacizumab administered together with beta radiation in treatment of pterygium play a role in additive effect and/or treatment of the side effects?

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Abstract

Pterygium is one of corneal-conjunctival pathologies that are frequently encountered by ophthalmologists. Its etiology, pathogenesis and treatment have been caused controversy for many years and remain as a problem, which is yet to be fully enlightened. The main treatment of pterygium is surgery. The most crucial postoperative problem is recurrence of the disease. Surgical methods have been sought for years to minimize recurrence with complementary treatment have been added to these methods including conjunctival autografting, bevacizumab and β -irradiation. No study was found to investigate additive use of bevacizumab and beta-radiation in postop or recurrent pterygium. Further phase 1 and phase 2 trials are needed to investigate the effectiveness of additive use of bevacizumab and beta-radiation in treatment of pterygium.

Keywords: Bevacizumab, beta radiation, pterygium

Introduction

Pterygium is one of corneal-conjunctival pathologies that are frequently encountered by ophthalmologists. It is hyaline degenerative disease of the conjunctiva in which fibrovascular connective tissue advancing from the bulbar conjunctiva toward the cornea. Pterygium shows expansion over the cornea, causing both cosmetic and visual problems. The incidence differs between 2.8% and 30.8% worldwide with an increase observed with advancing age. Its etiology, pathogenesis and treatment have been caused controversy for many years and remain as a problem, which is yet to be fully enlightened [1,2].

The main treatment of pterygium is surgery. The most crucial postoperative problem is recurrence of the disease. Relapse has been reported between 30% and 89% following classical surgery in this lesion which behavior can't be predicted. Surgical methods have been sought for years to minimize recurrence with complementary treatment have been added to these methods including conjunctival autografting, antimitotic drugs and β -irradiation [1-3].

Beta-radiation is among the additive medical treatment methods. Strontium-90 is preferred in the treatment of pterygium. These radioactive agents quickly and permanently block fibroblastic and arteriolar proliferation, thus reducing recurrence. After pterygium is excised, radioactive plaque is inserted on the sclera and kept until reaching the desired dose. [2]. There are numerous treatment protocols and dosage scheme for this method. In general, single dose (25 Gy) or divided doses (20 Gy/10, 27-30 Gray/3, 35 Gy/7 fractions) within 10-70 Gy range are administered [2-4]. The fraction dose and total dose applied in pterygium causes changes in the lens fibers and posterior subcapsular area. Accordingly several complications such as iris atrophy, corneal ulceration and edema, scleral ulceration, scleromalacia, restrictive diplopia, ptosis and infections are observed [2]. Vani et al. reported that no significant difference was found between high-dose fractionation vs. low-dose fractionation; cosmetic results were better and side effects were less with low-dose fractionation in patients who received postoperative adjuvant treatment using β -radiotherapy [4]. Vastardis et al. reported remarkable aesthetic and rehabilitative results with β -radiation compared to conventional treatments in relapsed pterygium lesions [3]. In their review, Ali et al. examined more than 6,000 lesions treated with surgical excision plus postoperative β -radiation using Strontium-90. The radiation was applied at doses differing between 10 and 60 Gy/1-6 fractions/1-6

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weeks and initiated within 3 days after the surgery. The incidence of local recurrence was lower than 15% with rarely observed major complications such as ulceration, scleral thinning, radiation related cataract and infections. The authors concluded that, postoperative β -radiation at 30 Gy/3 fractions/2-3 weeks initiating within the first 24h of the surgery is an effective and safe treatment modality and that local control rates were comparable to conjunctival autografting and chemotherapeutic agents and superior over simple surgical excision alone [2].

Studies have shown that angiogenic growth factors such as VEGF, bFGF, TGF β and PDGF are correlated with the formation and recurrence of pterygium. Recently, anti-VEGF/antiangiogenic treatment has been focused in order to treat pterygium, regress pterygium vessels, stop progression of pterygium and prevent postoperative recurrence [2]. Bevacizumab is a humanized monoclonal VEGF antibody, which binds to all VEGF isoforms and disrupt the interaction VEGF and its receptors, showing neutralizing effect [5]. Bevacizumab is widely used and reported to be effective in treatment of retinal and choroid diseases progressing with neovascularization, age related exudative macular degeneration, and macular edema diseases due to central retinal vein occlusion. Furthermore, bevacizumab is known to decrease side effects such as macular edema, maculopathy and optic neuropathy that reveal because of radiation [1,5].

Searching the literature, local control rates are reported as 90% to 94% and recurrence rates as 0% to 15% in patients receiving postoperative β -radiation [2]. Today, main target of beta-radiation therapy in pterygium is to reduce recurrence to 15%. In addition, new agents are being investigated in order to reduce, delay or prevent adverse effects developing in the eye due to radiation. Bevacizumab seems to be a preferred agent both in postoperation and recurrence of pterygium. Searching the literature, no study

was found to investigate additive use of bevacizumab and beta-radiation in postop or recurrent pterygium.

Conclusion

In conclusion; the lesion being in an early or advanced stage and a well-performed clinical evaluation plays a role in approach to pterygium. In addition, clinical classification should be taken into account in evaluation of treatment results. Further phase 1 and phase 2 trials are needed to investigate the effectiveness of additive use of bevacizumab and beta-radiation in treatment of pterygium.

Competing interests

The authors declare that they have no competing interest

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