Journal of Medicine, Physiology and Biophysics
ISSN 2422-8427 An International Peer-reviewed Journal
Vol.49, 2018

IS BEVACIZUMAB EFFECTVE IN MANAGING CENTRAL SEROUS CHORIORETINOPATHY MANAGEMENT

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Abstract:

Objective: To evaluate the efficacy of Bevacizumab in central serous chorioretinopathy (CSCR) **Methodology:** It is a randomized control trail. The study was conducted in Ophthalmology department of Allied Hospital, Faisalabad and Nishtar Hospital, Multan. From September 2016 to October 2017. Ethical approval was obtained from Hospital Ethics committee. Forty six patients took part in this study. Sample was collected using probability consecutive sampling technique. Computer software SPSS version 23 was used to analyze the data. Frequency and percentage was calculated for the qualitative variables like gender and Chi square test was applied to check the significance and association among variables. P value less than and equal to 0.05 was taken significant. **Results:** Forty six patients took part in the study belonging to both genders. There were 58.7% male (n=27) and 41.3% females (n=19) when gender distribution was analyzed. Mean and standard deviation for age came out to be 47.17±2.13. The baseline value for visual acuity had mean and standard deviation of 42.82±7.91, while Mean±S.D of visual acuity after treatment was 57.78±4.33. The difference between the means of visual acuity at baseline and after treatment was statistically significant (p=0.001). Similarly mean and standard deviation of central macular thickness before and after treatment was 357.89±96.17 and 149.76±30.19 µm respectively. There was reduction in the mean of central macular thickness after treatment and the difference between the two results was also statistically significant (p=0.001). **Conclusion:** This study concludes that bevacizumab is significantly effectual in the management of CSC. But more research work in the form of randomized controlled trails is required to evaluate the effectiveness of intravitreal bevacizumab in this condition.

Keywords: Bevacizumab, Chorioretinopathy, Visual acuity, Central macular.

Introduction:

Central serous chorioretinopathy was described as recurrent central syphilitic retinitis for the first time in 1866 [(1)]. Capillarospastic central retinitis, central serous pigment epitheliopathy, central serous retinopathy and central angiospastic retinopathy are the other names used for this disease [(2)]. Central serous chorioretinopathy occurs most commonly in middle aged men with age ranging between twenty to fifty years [(3)]. Psychological stress and people having type A personality are prone to development of central serous chorioretinopathy [(4)]. Other risk factors include chronic use of corticosteroids, sympathomimetic agents, some psychopharmacological agents and endogenous high levels of corticosteroids. Poor vision and longer period of rehabilitation is associated with smoking [(5)]. When serous detachment occurs from choriocapillaris, through retinal pigment epithelium, this condition can be defined as central serous chorioretinopathy [6]. Choroidal neovascularization, tumors or inflammation are among the other causes of retinal pigment epithelium leakage, which need to be ruled out to make the final diagnosis of CSC.

Serous chorioretinopathy has two distinct clinical presentations. Fluorescein angiography has been used to classify the cause of central serous chorioretinopathy by one or more particular secluded leak corresponding to the retinal pigment epithelium [7]. It has been well recognized by now that central serous chorioretinopathy can present as diffuse retinal pigment epithelial dysfunction, for instance, decompensated retinal pigment epithelium, chronic central serous chorioretinopathy and diffuse retinal pigment epitheliopathy. Diffuse retinal epithelium dysfunction is characterized by neurosensory detachment of retinal epithelium, over areas of atrophy of epithelium and mottling of the pigment. Broad areas of granular hyper-fluorescence are seen on fluorescein angiography, which comprises areas of one or more leaks.

Most common presentations of central serous chorioretinopathy are metamorphopsia, blurred vision, micropsia and mild dyschromatopsia [(8)]. Typical signs found on fundus examination are well demarcated detachment of retina at macula. Detachment of pigment epithelial can also occur in variable sizes, single or multiple. Sub retinal fluids can be turbid\fibrinous or clear. Sub retinal pigment epithelium space can also be occupied by the turbid fluid. Laser photocoagulation, photodynamic therapy and pharmacological agents like acetazolamide, mifepristone, propranolol and ketoconazole are different modes of treatment available for central serous chorioretinopathy [(9)]. Despite the availability of these treatment options, no modality of these agents has shown to reduce the reoccurrence and final visual acuity; instead these treatments only shorten the duration of symptoms.

Pathophysiology of central serous chorioretinopathy is yet to be clarified. Indocyanine green angiography is the modern technique used to try and establish the definite etiology of central serous chorioretinopathy. This technique has shown that choroidal permeability changes are the first and foremost reasons which lead to the development of central serous chorioretinopathy [10]. This theory suggests that, in order to treat this condition, target of the treatment should be the choroidal vascular changes. Bevacizumab has anti permeability properties and thus thought to be effective in reversing the changes found in central serous chorioretinopathy [11]. It is a monoclonal antibody against vascular endothelial growth factor. The rationale of our study is as central serous chorioretinopathy is disease which leads to eye sight loss, So it should be managed effectively. Our study will provide a base for formulating guidelines for central serous chorioretinopathy management in our region and for further research on this subject.

Materials and Methods:

It is a randomized control trail. Study held in Ophthalmology department of Allied Hospital, Faisalabad and Nishtar Hospital, Multan. From September 2016 to October 2017. Ethical approval was obtained from Hospital Ethics committee. Forty six patients took part in this study. Sample was collected using probability sampling, simple random sampling technique and using reference study by Lim SJ et al [(12)]. Patient aged between 20 and 50 years, both genders and patients of CSCR as per operational definition were included in this study. Patients with previous use of intravitreal bevacizumab, having choroidal neovascularization, more than 21 mmHg of intraocular pressure, history of thromboembolism, intraocular inflammation and retinal detachment were excluded from this study. All the patients included in this study presented in out-patient department of Mayo Hospital Lahore. Informed consent was ensured before including them in the study.

Name, gender and age were recorded of each patient prior to the initiation of the study. Detailed anterior segment slit lamp examination, intraocular pressure measurement, dilated fundal examination and visual acuity was recorded at baseline and also at each follow up visit. Pre-op OCT was done and macular thickness was documented. Injection was administered into the vitreal cavity using a 27G needle under topical anesthesia. To control confounders and thus bias in study result, exclusion criteria were strictly followed.

The patients were followed at 4 weeks intervals, fundus examination was done and resolution of central serous chorioretinopathy was recorded. Optical coherence tomography (OCT) was done at 4 weeks intervals for 3 months to assess the central macular thickness (CMT). After 4 weeks repeated injections were performed for persistent or recurrent central serous chorioretinopathy documented by optical coherence tomography imaging. Computer software SPSS version 23 was used to enter and analyze the data obtained from the procedure. Frequency and percentage was calculated for the qualitative variables like gender and Chi square test was applied to check the significance and association among variables. P value less than and equal to 0.05 was taken significant.

Results:

A total number of 46 patients took part in the study belonging to both genders. There were 58.7% male (n=27) and 41.3% females (n=19) when gender distribution was analyzed. Mean and standard deviation for age came out to be 47.17±2.13 (Table 1). The baseline value for visual acuity had mean and standard deviation of 42.82±7.91, while Mean±S.D of visual acuity after treatment was 57.78±4.33. The results of mean visual acuity at baseline were lesser than the mean of visual acuity after treatment. The difference between the means of visual acuity at baseline and after treatment was statistically significant (p=0.000). Similarly mean and standard deviation of central macular thickness before and after treatment was 357.89±96.17 and 149.76±30.19 µm respectively. There was reduction in the mean of central macular thickness after treatment and the difference between the two results was also statistically significant (p=0.000) (Table 2).

Table. 1

Demographic characteristics

Variable	Presence
Gender	
Male	58.7% (n=27)
Female	41.3% (n=19)
Age (years)	
47.17±2.13	

Table. 2

Outcome Variables

Variable	Before Treatment	After Treatment	Test of Sig.
visual acuity	42.82±7.91	57.78±4.33	**t=-10.69, p=0.000**
central macular thickness (µm)	357.89±96.17	149.76±30.19	**t=13.74, p=0.000**

Discussion:

As we have discussed earlier that there are multiple treatment options available for central serous chorioretinopathy like pharmacological agents (propranolol, acetazolamide and ketoconazole), laser photocoagulation and photodynamic therapy but in none of these treatment options actually reduce the reoccurrence and improve visual acuity of the patients instead only have effect on symptoms of the central serous chorioretinopathy. In our study we administered intravitreal bevacizumab and results of the outcome in terms of visual acuity and macular thickness were analyzed. The results came out to be very promising and showed that intravitreal bevacizumab can be used as an effective treatment option for central serous chorioretinopathy.

The results of our study are in accord to the results of the study done by Schaal KB et al [13] and multiple other authors according to whom intravitreal bevacizumab can be regarded as an effective management option in the treatment of central serous chorioretinopathy. In another previous study like this study found that all the patients who were treated with intravitreal bevacizumab had improvements in fluorescein angiographic leakage, visual acuity and resolved neurosensory detachment of retina [14]. Results of another study showed that, twelve patients treated with intravitreal bevacizumab and eight patients treated with other treatment options had evidence of restored morphology at 6 months after treatment ($p<0.001$). They further described that vision was improved in patients who were treated with bevacizumab as compared to the others who were not, and also that central foveal thickness was also considerably lower after the treatment in these patients as compared to the patients who did not receive intravitreal bevacizumab (297±172 µm and 174±68 µm respectively ($P<0.001$)). These results clearly show that intravitreal bevacizumab although a novel treatment option yet can be used effectively in the treatment of selective groups of individuals suffering from chronic, persistent and idiopathic central serous chorioretinopathy [15]. In acute central serous chorioretinopathy, use of intravitreal bevacizumab may show quick improvement by reducing angiographic leakage and by resolving the neurosensory detachment. Studies have proved that intravitreal bevacizumab not only improves the condition of chronic central serous chorioretinopathy but has equal efficacy in acute central serous chorioretinopathy as well [16]. Recurrent cases of central serous chorioretinopathy can be effectively managed by the use of intravitreal bevacizumab as shown in a previous study. Despite all these studies on the efficacy of bevacizumab as a treatment option, evidence on long term efficacy of this antibody is still lacking, but studies show that it is associated with relatively lower risk of complications and improves vision and macular thickness [17].

In contrast to the results of our study a Korean study has stated that in treating patients suffering from acute central serous chorioretinopathy, bevacizumab is not much effective as it has no helpful effect in severe settings when compared to a study group but it also showed that it had no adverse effects. They emphasized on the fact that further investigations are required in order to establish the definitive role of bevacizumab as an option in

central serous chorioretinopathy [18]. A randomized control trail was done to compare the efficacy of intravitreal bevacizumab and photodynamic therapy, which was in favor of the use of photodynamic therapy over intravitreal bevacizumab. Central foveal thickness was reduced more in patients who undergone photodynamic therapy as compared to the other group which opted for intravitreal bevacizumab 53% and 25% respectively. Thus establishing the fact that intravitreal bevacizumab is not as much effective option of treatment as photodynamic therapy is. Despite these results, they concluded that intravitreal bevacizumab is safe and effective treatment of central serous chorioretinopathy [19.] Among the many recent and previous studies, another study showed results in contrast to the results of the study just mentioned and their conclusion was that, foveal thinning and improvement in vision was more significant in group of patients managed with intravitreal bevacizumab as compared to those treated with low fluence photodynamic therapy [20]. In another study a one year duration follow up was carried out on patients treated with intravitreal bevacizumab and the results were quite satisfactory in terms of treatment and outcome of central serous chorioretinopathy and thus concluded that intravitreal bevacizumab is an effective treatment for this chronic condition [21].

Conclusion:

This study concludes that bevacizumab is significantly effectual in the management of CSC. But more research work in the form of randomized controlled trails is required to evaluate the effectiveness of intravitreal bevacizumab in this condition.

Conflict of Interest:

There was no conflict of interest regarding this study.

Funding Source:

No extra funding source was used.

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