**ABSTRACT**

**11.1. Introduction**

Age related macular degeneration (AMD) is according to World Health Organization (WHO) one of the most common causes of permanent visual impairment and blindness in developed countries among people over 60 years of age. The prevalence of AMD is 8,7 % and it is increasing as a result of population ageing.

Wet AMD is characterized by the presence of choroidal neovascularization (CNV), initially localized below the retinal pigment epithelium ( RPE). These abnormal vessels can pass through the RPE and impair neurosensory retina by causing subretinal and intraretinal hemorrhages, retinal edema, exudation and macular scarring. The dynamic course of the disease can lead to severe central vision impairment within months or weeks. Early visual acuity stabilization plays the key role in wet AMD therapy. The gold standard of modern wet AMD therapy is intravitreal administration of vascular endothelial growth factor antagonists (anti – VEGF), mainly aflibercept and ranibizumab.

The corneal endothelium is responsible for maintaing its optical properties. It is characterized by limited regenerative capacity. Central corneal cell density decreases at rate 0,6 % per year. Increased corneal endothelium cell loss can be caused by congenital factors such as dystrophies and developmental disorders, or by acquired diseased such as surgical and non-surgical trauma, increased intraocular pressure, particular eye conditions as well as general diseases and some medications. Several clinical studies confirmed high safety profile of anti- VEGF agents, but still there are only few reports concerning potentially harmful effects of these substances on corneal endothelium.

**11.2 Aims**

The aim of this study was to assess conreal endothelium cells among patients with wet AMD treated with intrvitreal injections of aflibercept or ranibizumab. Analysis included corneal endothelial cell density (CD), hexagonal cells percentage (%hex), coefficient of variation (CV) and central corneal thickness (CCT). It was crucial to compare these parameters between group of patients treated with ranibizumab and group od patients treated with aflibercept. Additionally, the analysis concerned corneal characteristics in patiens divided into particular age groups.

**11.3. Material and methods**

In a retrospective study, 110 eyes of 106 patients (both male and female), aged 52 to 93 years old, were analized. Each patient was qualified for anti – VEGF treatment due to acitve wet AMD. 60 eyes were treated only with aflibercept and 50 eyes were treated only with ranibizumab. For the subsequent three months every patient received once in a month one intravitreal injection of 0,5 mg of ranibizumab or 2 mg of aflibercept. During the whole observation period each patient received only three injections.

Corneal analysis was obtained with CSO SP – 02 specular microscope. Examinations were performed before initial treatment, after each injection and afer six months after the first injection.

The inclusion criterion was active wet AMD, never treated before, except for oral vitamins and minerals supplementation. The exclusion criteria comprised intraocular surgery in the past in treated eye, glaucoma, pseudoexfoliationa syndrome, type I or type II diabetes, connective tissue disease and use of contact lenses.

**11.4. Results**

In the presented study, statistically significant corneal endothelial cell loss was shown, regardless the type of anti – VEGF agent. In comparison to group treated with ranibizumab, group treated with aflibercept presented greater endothelial cell density loss at each measuring point. The percentage of hexagonal cells was decreased int both groups. This study also showed slight increase in polymegathism in both treated groups. Ranibizumab proved to cause small increase in central corneal thickness, while in aflibercept group central corneal thickness remained unchanged.