

Predicting Treatment Response in Wet Age-Related Macular Degeneration Through OCT Biomarkers

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Introduction: Wet age-related Macular Degeneration (AMD), characterized by macular neovascularization that leads to fluid leakage and retinal hemorrhage causing severe and sometimes irreversible visual damage, is one of the biggest causes of blindness in developed countries (1). Treatment with anti-vascular endothelial growth factors (anti-VEGF) has been revolutionary, but not all patients respond completely to treatment and have unmet clinical needs (2). The schedule and response to these treatments is a burden for patients/carers and hospitals (2). The use of optical coherence tomography (OCT) has become a valuable tool for diagnosing and monitoring this pathology. There are biomarkers in the retina detectable with state-of-the-art OCT that may be associated with visual recovery after treatment with anti-VEGF (3). **Objectives:** Identify the biomarkers with the most influence on the response to treatment and develop various supervised learning algorithms to predict the response to treatment in order to better adapt the treatment to each patient, reducing the burden that the tight schedule of these injections has on patients/caregivers, hospitals and health professionals. **Methods:** We collected general data, visual acuity and OCT from patients with wet AMD undergoing treatment with anti-VEGF injections, followed at the São João Local Health Unit for 3 years. A statistical analysis and study of the variables with the greatest weight in the response to treatment will be carried out. With these variables, we intend to use various supervised learning algorithms to see if it is possible to create a model with a good accuracy rate for predicting the response to treatment. **Results:** We have collected data from 98 eyes of 81 patients, 29 female (35.8%) and 52 male (64.2%) with mean age of 76.93 ± 7.6 years, with mean initial visual acuity of 60.15 letters and 58.76% of eyes with type I membrane. With this data we will identify the biomarkers with the most influence on the response to treatment and select the algorithm with the best model evaluation metrics. **Conclusions:** By identifying biomarkers and selecting an algorithm, we can find ways to improve patient treatment. Making this study multicentric would be an improvement, but data collection always requires specialized professionals and is time-consuming.

Keywords: Wet age-related macular degeneration, anti-VEGF treatment, ocular coherence tomography biomarkers, supervised learning algorithms

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