

Letter to the Editor

Impedance Eye Recording IER: A New Glaucoma Diagnostic Tool?

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Described in 1941 by two New Yorker physicist brothers, KS Cole et RH Cole, who propose and publish together a new mathematical equation plotting polymers' electrical reactance/resistance correlation, Rea/Res, named the Cole-Cole curve [1]. Since then, this method is used to know how sinusoidal current goes through living tissues, be they vegetable or animal. Applied on the human body it is included in weighing machines to adapt sports training, for example. In medicine to evaluate many organs like lungs, breast [2] or skin tumours, heart and brain or to separate normal from tumoral cells. In Clinical Ophthalmology to our knowledge, they are not yet similar papers. At the present time PubMed, key words are for first eye impedance or eye and clinical impedance spectroscopy, in August 2021, 22 references without strict IER correlations and then none. Closest publications are Fukuda [3] to quantify corneal defects, Jürgens [4] about in vitro eye impedance and CA Gutierrez [5] about lens hydration.

In the University Eye Clinic electrophysiology lab, Lausanne Switzerland, together with MVM [6] and Fabrinal [7] we have modified the ERG-Jet (electroretinogram) contact lens from an electric retinal captor to an emitting electrical injector, thus describing and creating

sure IER scientific basic data to obtain acceptable impedance ocular signal/noise recordings. Our first results show this method is easy to use, quick and without discomfort. Furthermore we found Rea/Res age-dependent [8]. Now we are in the process of collecting normal IER values on healthy young people to evaluate sensitivity then specificity. In the recent Springer paper [9] we describe a phantom glaucoma model to simulate extra/intra cell water concentrations in the ocular anterior chamber. Therefore, we found this pilot study a good predictive model. That is the reason why we presume that this relatively new IER providing Cole-Cole ocular curve can probably be a useful complementary tool to understand glaucomas and/or other ophthalmic diseases where extra/intra cell water concentrations are abnormal.

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