



Electroretinography in Birdshot Uveitis



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The Electroretinogram, (ERG), is used as a means of monitoring progression in Birdshot chorioretinopathy and Uveitis. It represents the massed electrical activity of the retina and is recorded with an electrodes placed on the cornea or lower eyelid. By precisely controlling the stimulus parameters it is possible to examine the activity of the different layers of the retina, which allows for the localisation and quantification of any lesion or dysfunction.

The standard ERG is recorded in response to a brief flash of light. By varying the stimulus parameters response from different retinal structures can be extracted.

The pattern ERG, (PERG) is recorded in response to a reversing black and white checkerboard, and represents the response from the central retina.

Two further techniques which may be useful screening methodologies; colour contrast sensitivity, (CCS), a technique for detecting and monitoring small changes in colour discrimination, and a new hand held ERG screening device, (RETeval) from LKC, are shown.

Presented below are the selected ERG results from two patients, showing some of the typical variations over time and highlighting the parameters utilised in clinical management of the condition.

The 'standard' ERG consists of a negative a-wave originating largely in the photoreceptors, followed by a positive going b-wave generated by the bipolar cells, the fast oscillations on the rising edge of the b-wave originate in the amacrine cells. Whilst the ERG tests the whole retina, by varying the stimulus parameters different retinal component responses can be extracted.

The pattern ERG, whilst driven by the macular cones is generated by the retinal ganglion cells, in response to a reversing black and white checkerboard.

The rod b-wave represents the activity of the bipolar cells, driven by the rod photoreceptors. Loss of amplitude demonstrates either a loss of system sensitivity or a reduction in the number of functioning rod photoreceptors.

With increased stimulus intensity, the a-wave develops. The relationship between the a and b-waves gives an measure of activity in the retina, whilst a reduction in the a/b-wave ratio can identify a problem in the inner retina.

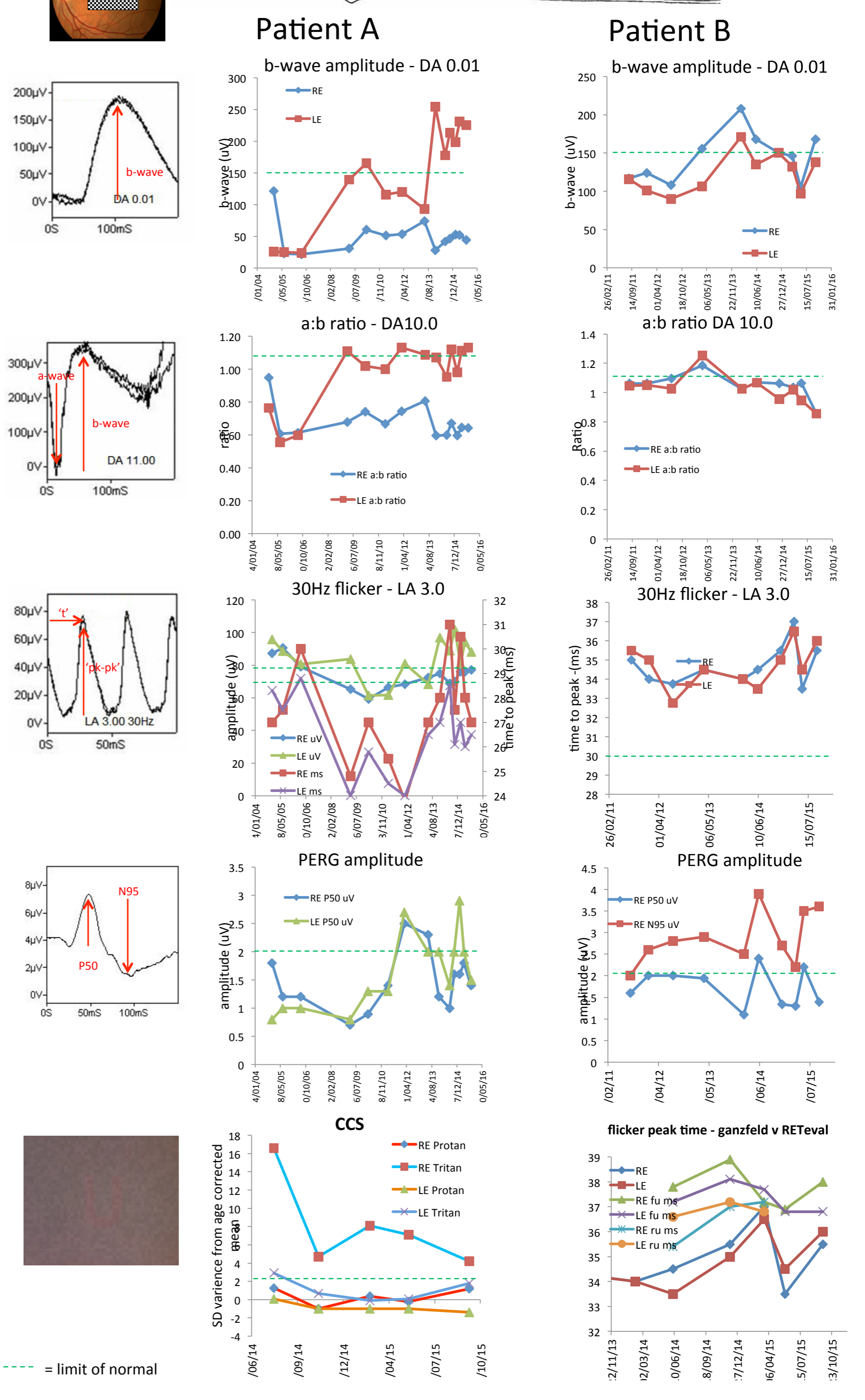
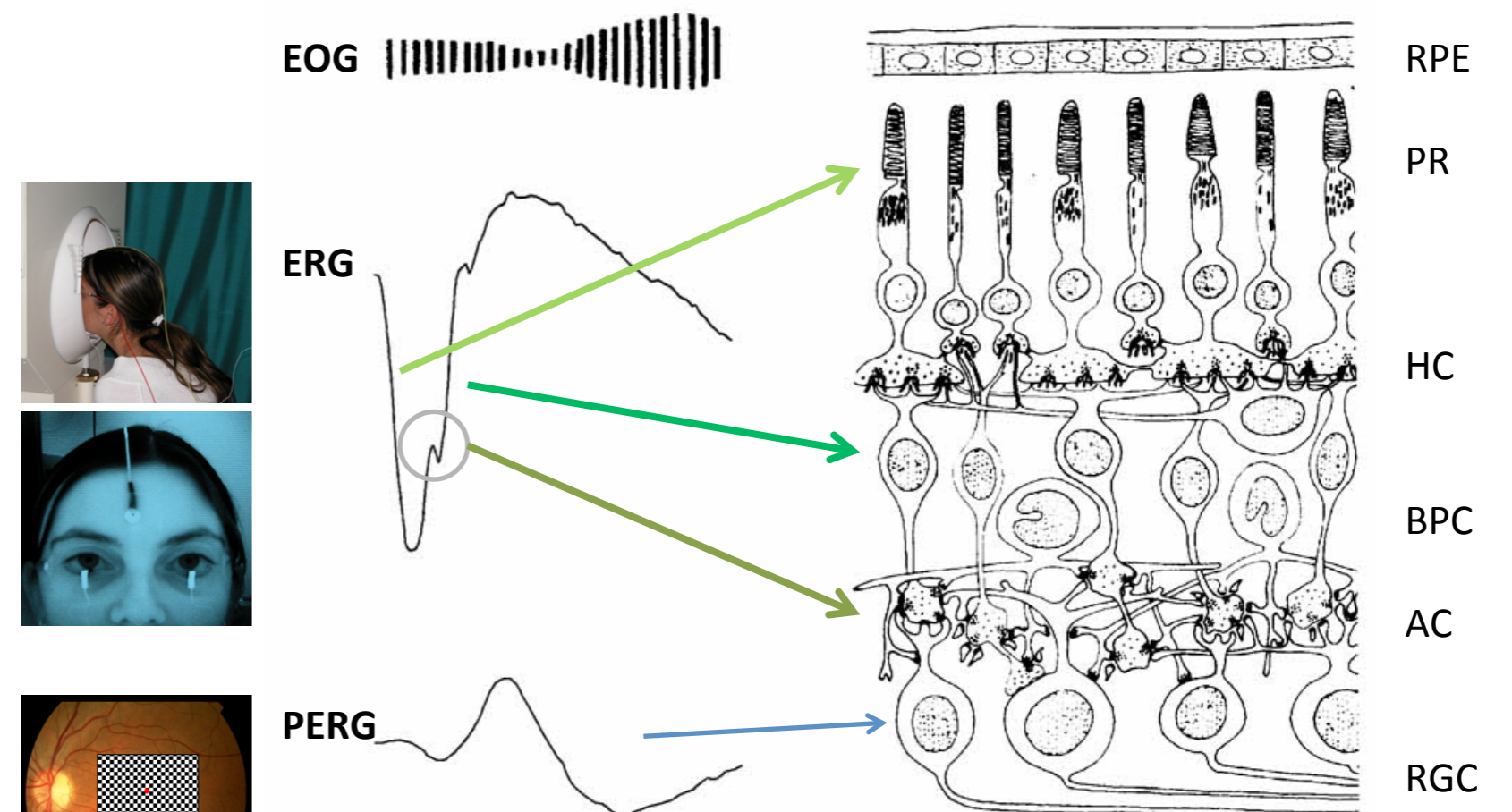
By using a rapidly flickering light super-imposed on a bright background, the cone receptors can be isolated. The implicit timing of this response is a key indicator used in the monitoring of inflammatory eye disease.

The pattern ERG is a generated by the retinal ganglion cells in response to stimulation of the macular cones. It is used to assess the function of the central 15 degrees of the retina.

Colour contrast sensitivity tests for subtle changes in colour discrimination which are sometimes reported by patients with inflammatory eye disease. The most common problem is a loss of blue yellow sensitivity.

The RETeval™ is a hand held ERG system which records the flicker ERG.

Both of these techniques are being investigated as potential screening methods for use in the Uveitis clinic.



----- = limit of normal