ERG CHANGES IN A TRIPLE TRANSGENIC MOUSE MODEL FOR ALZHEIMER`S DISEASE

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Purpose: To study the retinal function of the triple transgenic mouse model (3xTg-AD) for Alzheimer`s disease (AD) by comparing retinal electrophysiological responses in 3xTg-AD mice with those in the background control (b6;129-PS1). The responses were measured between 2 and 12 months of age. **Methods:** ERGs were recorded from 44 3xTg-AD mice and from 23 background controls with a contact lens electrode on the cornea, a needle reference electrode on the head and a ground on the tail. Recordings were obtained for: 1) Maximum scotopic response (30cd.s/m2); 2) Light-adapted (30 cd/m^2) flicker pulses (30 cd.s/m^2) at 12, 18 and 30 Hz. **Results:** 87% of control mice and 28% of the 3xTg-AD had very abnormal ERGs with a large b-wave implicit time (111,73 ± 22,56 ms) and no OPs. The others displayed ERGs with OPs and with b-wave implicit times within the range (45,31 ± 6,74 ms) expected from the literature. In the latter group, age dependent changes in the flash ERG were found for the a- and b-wave amplitudes. While the control group exhibited a mean decrease from 193,26 to 97,06 µV in the a-wave amplitude and a mean decrease from 452,4 to 230,71 µV in the b-wave amplitude between 6 and 12 months, 3xTg-AD group presented a low and constant response (a-wave= 143,4 ± 19,3 µV; b-wave= 303,5 ± 49,7 µV) between 6 and 12 months of age. Flicker amplitudes (1^{st} harmonic after Fourier analysis) from the 3xTg-AD group were significantly reduced compared to controls at 6 months, but not at 12 months, both for the 12 Hz (p=0,0001) and for the 18 Hz (p=0,0001)stimuli. **Conclusions:** Comparison of control and transgenic mice with ERGs with OPs and implicit times within the normal range, revealed a physiological impairment of the retina of AD mice. The a-wave amplitude decrease suggests that the effect involves loss or impairment of photoreceptor function. We conclude that AD may also affect the function of the retina.

Key-words*:* retina, electroretinography, Alzheimer, 3xTg-AD

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