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NEUROFUNCTIONAL ACTIVATION OF HUMAN VISUAL CORTEX IN AMBLYOPIA INDUCED BY S/NRI TREATMENT AND SENSORY STIMULATION. POTENTIAL APPLICATION FOR AN EYESIGHT IMPROVEMENT

ACTIVATION NEUROFUNCTIONNELLE DU CORTEX VISUELLE HUMAIN EN AMBLYOPIE INDUITE PAR TRAITEMENT S / NRI ET STIMULATION SENSORIELLE. APPLICATION POTENTIELLE POUR UNE AMÉLIORATION DE LA VUE

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Introduction: The effective role of long-term antidepressant administration in promoting the neurogenesis and synaptogenesis as well as in increasing the expression of the Brain Derived Neurotrophic Factor (BDNF) has been clearly demonstrated. A model of neuronal restored plasticity has been also demonstrated in the visual cortex of amblyopic adult rodents treated with the Selective Serotonin Reuptake Inhibitor. Amblyopia, otherwise known as "lazy eye", is a disorder of the visual system characterized by poor or indistinct vision in one eye.

Methods: Our observation has been focused on 3 male adult subjects with different levels of amblyopia. We measured the Best Corrected Visual Acuity (BCVA) at T0, T1 and T2 (respectively 0 - 6 - 12 months. For one subject we also measured the Visual Evoked Potentials (VEPs), with pattern reversal of 15° and 60°. We also prescribed: daily exposure for one/two hour/s to visual stimulation of the amblyopic eye (such as watching TV) for the whole period of observation; and daily intake of a Serotonin/Noradrenalin Reuptake Inhibitor antidepressant.

Results: Measurements at T2 showed stable, functional, increase of BCVA in all cases; for the subject investigated with VEPs, a decrease of P100 Latency Peak Time in msec and an increase of N75- P100 Amplitude in μV .

Discussion: The clinical and the experimental results of the cases observed seem to confirm other findings and to demonstrate that also the human adult's neuronal cortex never completely developed, as the amblyopic one can be activated or shaped, after proper stimulation, in order to support its natural and specific function. The elicited functional/ structural adaptations observed in our cases, with the improvement of the eyesight BCVA and the VEPs, might be explained through the mechanism of neuroplasticity, likely enhanced simultaneously by the S/NRI related production of BDNF and the active visual-sensory stimulation. If confirmed by further research, a potential clinical application might be proposed for other similar conditions.