Integrated Neural Photo-stimulation and microperimetric fixation analysis.

Clinical experience of the Low Vision Research Centre of Milan

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Purpose:
Neural photo-stimulation improves VEPs, Visus and reading coefficient. We have hypothesized that photo-stimulation as the principal mechanism improves the quality of fixation, and in a chain reaction beginning with the foveal detection, all the other visual parameters.

Methods and patients:
In order to do this study we have developed a new method of stimulation called Integrated Neural Photo-stimulation (INP), which incorporates three methods: Visual Pathfinder, I.B.I.S. and Sound Biofeedback.

At the beginning (T0) and at the end (T1) of each cycle we analyze the fixation percentage within foveal two central degrees, stability score, BCVA, near visual acuity and reading line. We have hypothesized that integrated photo-stimulation could improve visual acuity and reading. This increase can be regulated and improved depending on the photo-stimulative method used. At the moment, we feel that Integrated Neural Photostimulation causes a further increase of the fixation percentage and foveal detection, as such it has been analyzed with micropereimetry and can be used successfully during visual rehabilitation.

Results:
1) The fixation percentage changes:
Group A, from 43,17% to 69,62% (T1), increase 26,45% (p=0,0000000129 – St. Dev. = 0,344299151).
Group B, from 0,38 to 0,61, increase 61,38% (p=0,0000000129 – St. Dev. = 31,320474), Group C from 22,2 pts to 16,1 pts, increase 6,1 pts (27,4%) (R= 0,039093802 - St. Dev. = 0,344299151).

2) The BCVA changes:
Group A, from 0,08 to 0,39, increase 0,31 (37,5%) (R= 0,000000275227 - Dev.St. = 0,300439).
Group B, from 0,38 to 0,45, increase 0,07 (18,4%) (R= 0,039093802 - Dev.St. = 0,346229951).

3) The near visual acuity changes:
Group A, from 29,27 pts to 24,21 pts, increase 5,06 pts (17,28%) (R= 0,000049059 - Dev.St. = 0,2947622).
Group B, from 22,2 pts to 16,4 pts, increase 5,8 pts (27,4%) (R= 0,002380574 - Dev.St. = 0,027135108).

Conclusion:
This confirms that the neural photo-stimulation, through a better collimation of fixation within two central degrees, results with an improvement of foveal detection which determine an improvement of visual acuity and reading. This increase can be regulated and improved depending on the photo-stimulative method used. At the moment, we feel that Integrated Neural Photostimulation causes a further increase of the fixation percentage and foveal detection, as such it has been analyzed with micropereimetry and can be used successfully during visual rehabilitation.