OMICS Group Conferences
Accelerating Scientific Discovery
3rd International Conference on
Clinical & Experimental Ophthalmology
April 15-17, 2013 Hilton Chicago/Northbrook, USA

The effect of retinal stimulation on internal visualization systems

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Abstract

Research has found that retinal stimulation can influence other systems within the body, such as the auditory system. Alteration of light intensity, frequency, amount or direction on the retina changes patients' ability to accurately identify the origin of sounds. This internal conception of space and the relationship between visual and auditory localization involves non-image forming retinal pathways that can be disturbed by certain types of diseases and/or injuries. For instance, after a concussion, patients may perceive distance and location incorrectly. Similarly, there will often be mismatched processing of visual and auditory stimuli – patients will fail to accurately identify sound sources. A brief assessment of this internal spatial construct can be attained by a Z-Bell© Test, designed to assess interactions between auditory and visual localization processing, and to adjust sensory mismatches with particular types of eyeglasses, providing an added dimension to eye care. The connection between the retina and the body is not limited to auditory spatial perception, but may also involve other internal systems. For instance, intrinsically photosensitive retinal ganglion cells (ipRGCs) affect circadian rhythms. Retinal stimulation affects brain activity, which in turn can affect body functions. In patients with delicately balanced nervous systems, who are genetically predisposed to certain environmentally-induced diseases, sensory mismatches create additional stress. These linkages between nonvisual perception and external eyesight open the possibility that imbalances can be associated with certain pathologies. By implication, stimulating the retina to correct these sensory mismatches may lessen overall stress, and potentially making the body more resistant to disease.

Biography

Deborah Zelinsky, O.D., F.N.O.R.A., F.C.O.V.D. is an optometrist whose cutting edge research in retinal circuitry and neuro-optometric rehabilitation has been taught worldwide. She has 3 patents in novel usages of retinal stimulation and is the founder of the Mind-Eye Connection in Northbrook, Illinois. Her innovative work on brain injury has been published in journals and book chapters. Currently, she is serving as a Neuro Champion for the Society for Neuroscience, a reviewer for the Journal of Physical Medicine and Rehabilitation and a Clinical Assistant Professor for the Western University College of Optometry in Pomona, California, hosting an externship for 4th year interns. Previously, she has been a scientific grant reviewer for the Department of Defense Congressionally Directed Medical Research Program.