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EuroTimes Breaking News

Date Posted 17/05/2009

Electronic subretinal implants may provide useful vision to blind retinitis pigmentosa patients

An electronic subretinal implant in investigational trials can enable blind retinitis pigmentosa patients to read letters from a screen and recognise the direction of fine stripe patterns, Eberhart Zrenner MD, University of Tuebingen, Germany told the 9th Congress of EURETINA.

The subretinal implant consists of a 3.0 mm by 3.0 mm array of 1500 photodiodes which act as light sensors, a neighbouring array of electrodes which stimulate the bi-polar cells, and an external energy source attached to the implant via a cord which passes from behind the ear into the eye.

It also has an array of 16 electrodes which are directly stimulated by the energy source for testing and calibration purposes. The retinal chip is implanted transchoroidally near the macula.

So far, 11 retinitis pigmentosa patients who have been blind for two to 15 years have undergone implantation with the chip. The surgery was free of any major complications such as retinal detachment and or haemorrhages.

In a series of experiments three patients implanted with the device were asked to identify or describe letters or patterns presented to them by direct stimulation or by images appearing on a screen in front of them.

The first patient, under direct stimulation, correctly recognised the direction of the letter 'U', presented with the opening in four different directions in 20 out of 24 cases. The second patient correctly differentiated letters via the direct stimulation electrode array in 12 out of 12 cases. In addition with the light sensitive subretinal chip, he correctly differentiated 22 of 24 letters. The letters were 8.5 cm high and 1.7 mm wide and the screen was at a distance of 62 cm.

The third patient recognized the direction of lines or stripe patterns with the chip in 15 out of 20 cases, as did the first patient in 11 out of 14 cases and the second patient in 11 out of 12 cases.

"Active subretinal multi-electrode implants with currents close to recognition threshold produce retinotopically correct patterns that allow for the first time recognition of individual letters and stripe patterns up to 0.35 cycles/deg clearly supporting the feasibility of light sensitive subretinal multi-electrode devices for restoration of useful vision," Dr Zrenner concluded.



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