Alterations in retinal processing in regular cannabis users

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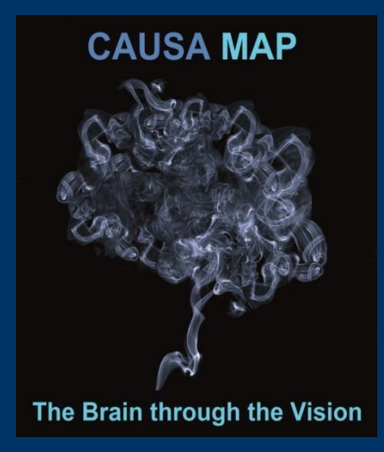
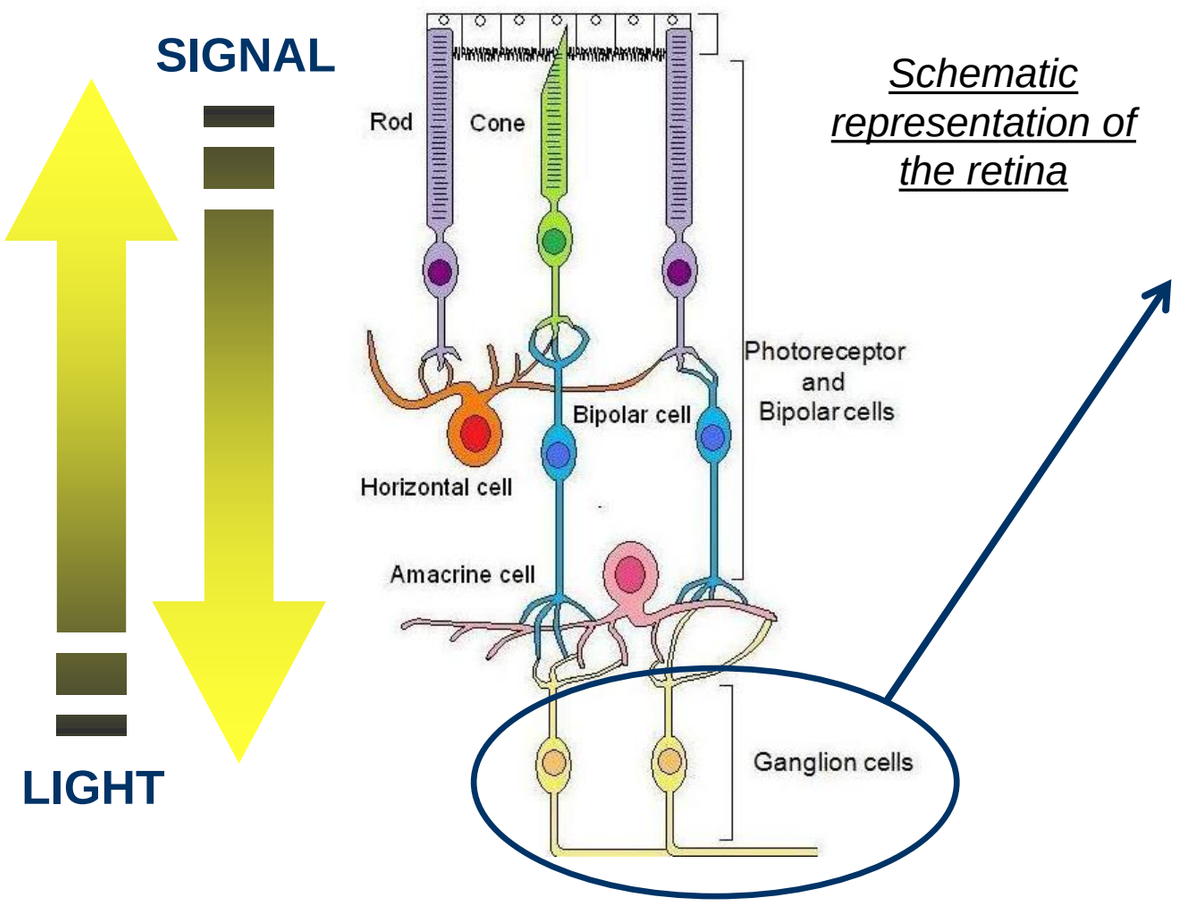


Background

• Cannabis is very widespread worldwide. However, the neural toxicity of cannabis remains poorly understood. There is a need for new methods assessing brain functioning in an indirect manner.

• The retina is a part of the central nervous system and is easily accessible by non-invasive methods.
• The last and more integrated stage of retinal processing is the ganglion cells layer and can be evaluated by the pattern electroretinogram (PERG).



Schematic representation of the retina

• Endocannabinoids are detected in the ganglion cells layer and known to modulate synaptic transmission (*for a review see Schwitzer et al., 2015)*.

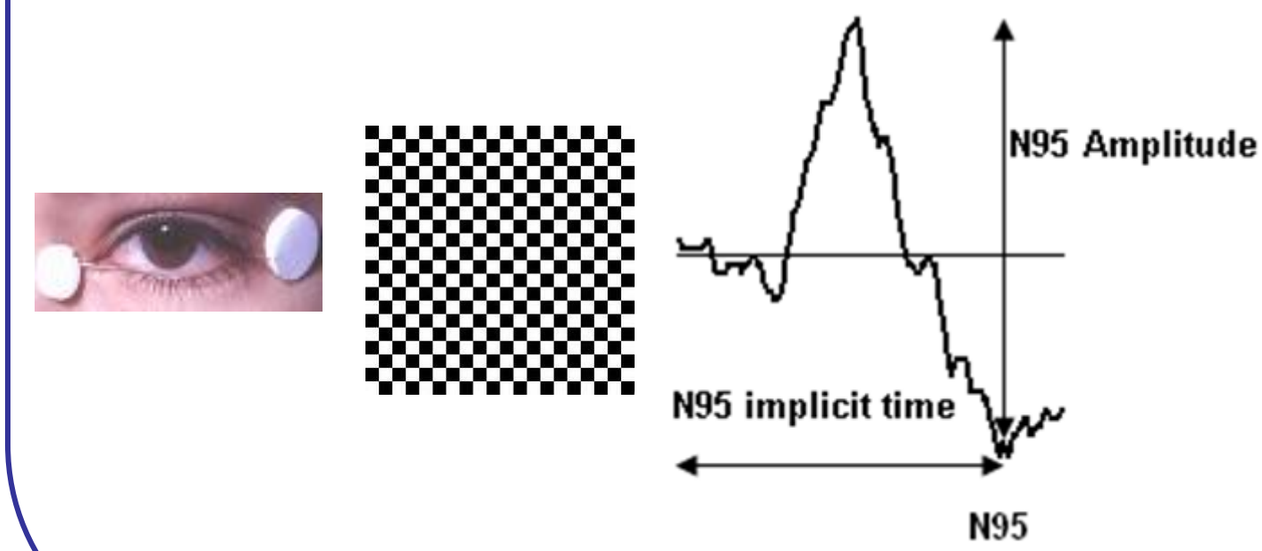
Aim: Assessment of the ganglion cells function in regular cannabis users compared to healthy controls.

Methods

• 28 regular cannabis users and 24 healthy controls were included. All were aged 18 to 35 years and had normal or corrected to normal visual acuity.

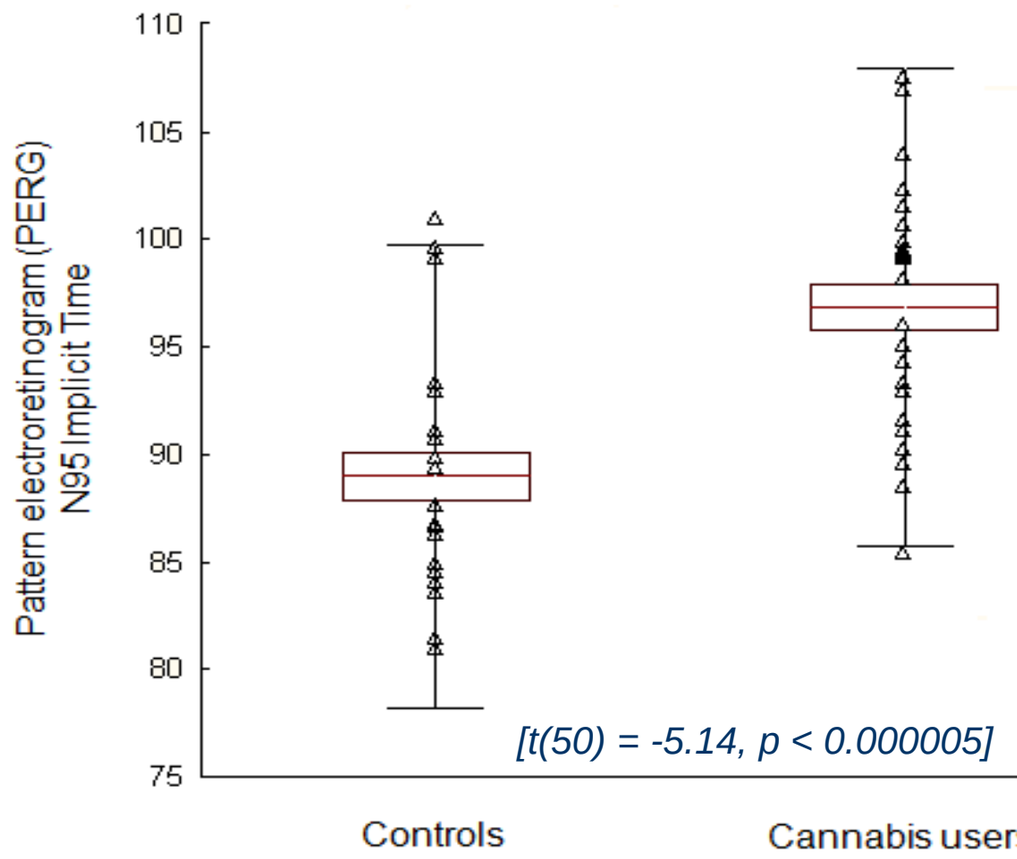
• PERG was recorded with DTL electrodes on non-dilated pupils, according to guidelines of the International Society for Clinical Electrophysiology of Vision (ISCEV).

• The best marker of the ganglion cells function is N95 amplitude and implicit time, which were evaluated.



DTL electrode, PERG checkerboards and typical PERG trace

Results



- *Mean*
□ *Mean±standard error*
⌶ *Mean±2*standard deviations*
Δ Raw data

Discussion

• Here, we show increased N95 implicit time in cannabis users compared to controls, with no difference in amplitude.
• These findings support a delay in transmission of action potentials by the ganglion cells.
• Such a finding underlines the potential benefit of PERG as a biological marker.

References:
Schwitzer T, et al. The cannabinoid system and visual processing: A review on experimental findings and clinical presumptions. Eur Neuropsychopharmacol J Eur Coll Neuropsychopharmacol 2015;25:100–12.

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