

- **ABN abstracts 2015 ABN Annual Meeting, 10 September 2015, Institute of Education, London**

USING TRANSCRANIAL MAGNETIC STIMULATION (TMS) TO PROBE EFFECTS OF VISUAL MOTION ADAPTATION ON PRIMARY VISUAL CORTEX (V1) EXCITABILITY IN BILATERAL VESTIBULAR FAILURE (BVF) PATIENTS

Hena Ahmad, Richard Roberts, Qadeer Arshad, Mitesh Patel, Adolfo Bronstein

1. Imperial College, London

Background and aim Patients with BVF report oscillopsia due to a defective vestibulo-ocular reflex causing retinal slip. No previous studies have probed visual cortical excitability using TMS and visual motion processing in these patients. We investigated the effects of visual motion adaptation on V1 cortical excitability in BVF patients and correlated this with psychophysical parameters.

Methods 12 BVF patients (7 males) aged 29–65 (mean=54.5) and 12 controls (6 males) aged 42–73 (mean=55) were recruited. Biphasic TMS pulses were applied at V1 and phosphene threshold (PT) was estimated. 3 measurement phases were (1) Stationary (2) Motion with optokinetic stimulation (OKS) Adaptation: OKS rightwards for 5 minutes 3) Post adaptation during viewing motion. All subjects completed questionnaires prior to the experiment. Results were analysed offline by calculating the probability of phosphene perception.

Results Baseline phosphene thresholds were significantly higher in BVF patients ($p=0.024$) reflecting reduced visual cortical excitability. Lower oscillopsia scores correlated with reduced baseline V1 excitability ($p=0.009$).

Conclusions This novel finding acts as a neurophysiological correlate for clinical observations of adaptive visual motion perception and is also correlated with psychophysical parameters. These results provide evidence for adaptive mechanisms leading to cortical plasticity following BVF.