Developing therapies for migraine

Background

Migraine is a common neurological disorder affecting around 1 in 10 people globally (Woldemanuel & Cowan, 2017). Despite being a disabling disorder, it is often considered 'unimportant' (Leonardi et al., 2005).

Sufferers have been found to have a 'hyper excitable' brain (Aurora et al., 2005) causing them to be unable to exclude 'noise' and process global motion (McKendrick & Badcock, 2004; O'Hare & Hibbard, 2016). hf-tRNS is considered to be safe and may be able to improve performance on these tasks by altering this activity (Nitsche et al., 2008). There is a need for alternative treatments for migraine (Charleston et al., 2018) and hf-tRNS has the potential to prevent an attack from happening.

Will hf-tRNS improve performance and could it be a viable treatment for migraine?

Method

15 migraine participants

Motion Coherence Task

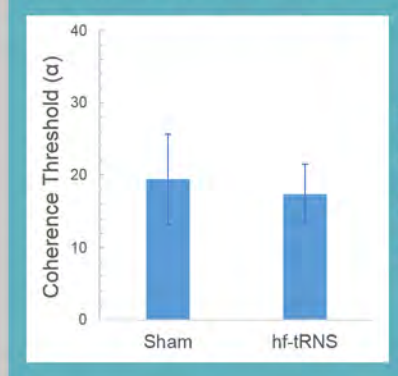
Internal Noise Task

External Noise Task

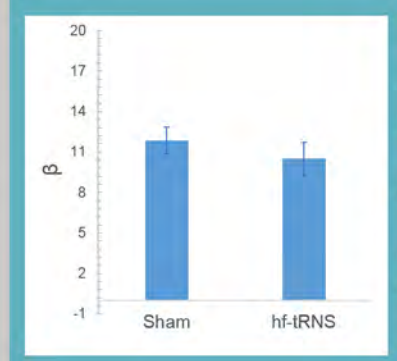
2 sessions lasting around 1 hour 30 minutes
One session recieved 20 minutes of stimulation (hf-tRNS)
Other sesion recieved 30 seconds of stimulation (SHAM)
These were counterbalanced

Results

Motion Coherence

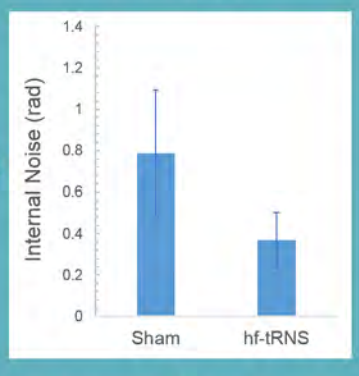


There was no significant difference between conditions for motion coherence thresholds ($t_{(13)}$ = 0.158, p = 0.877, d = 0.034)



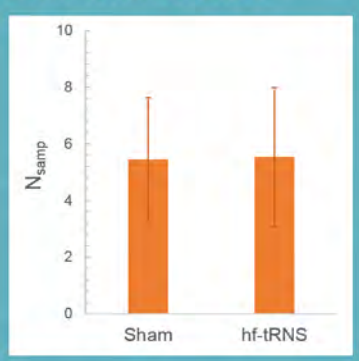
There was higher confidence for the hf-tRNS condition than the sham condition, however, this difference was not significant ($t_{(13)}$ = -1.521, p = 0.152, d = 0.33)

Internal Noise



There was no significant difference between conditions for internal noise thresholds ($t_{(13)}$ = 1.625, p = 0.128, d = 0.32)

External Noise



There was no significant difference between conditions in relation to the sampling ($t_{(13)}$ = -0.166, p = 0.870, d = 0.036)

Conclusions

No Significant differences were found between conditions, hence hf-tRNS does not improve participant performance. However, under optimal conditions (internal noise task), one trend we found was, participants required a smaller angle to detect the motion of the dots during the hf-tRNS condition. Despite not being significantly different from the sham condition, it is possible that when repeated with more participants, a significant difference could be found as our results may be underpowered.

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