

Short term effect of simultaneous CBT and TRT for tinnitus treatment : Analysis by subjective survey and objective qEEG

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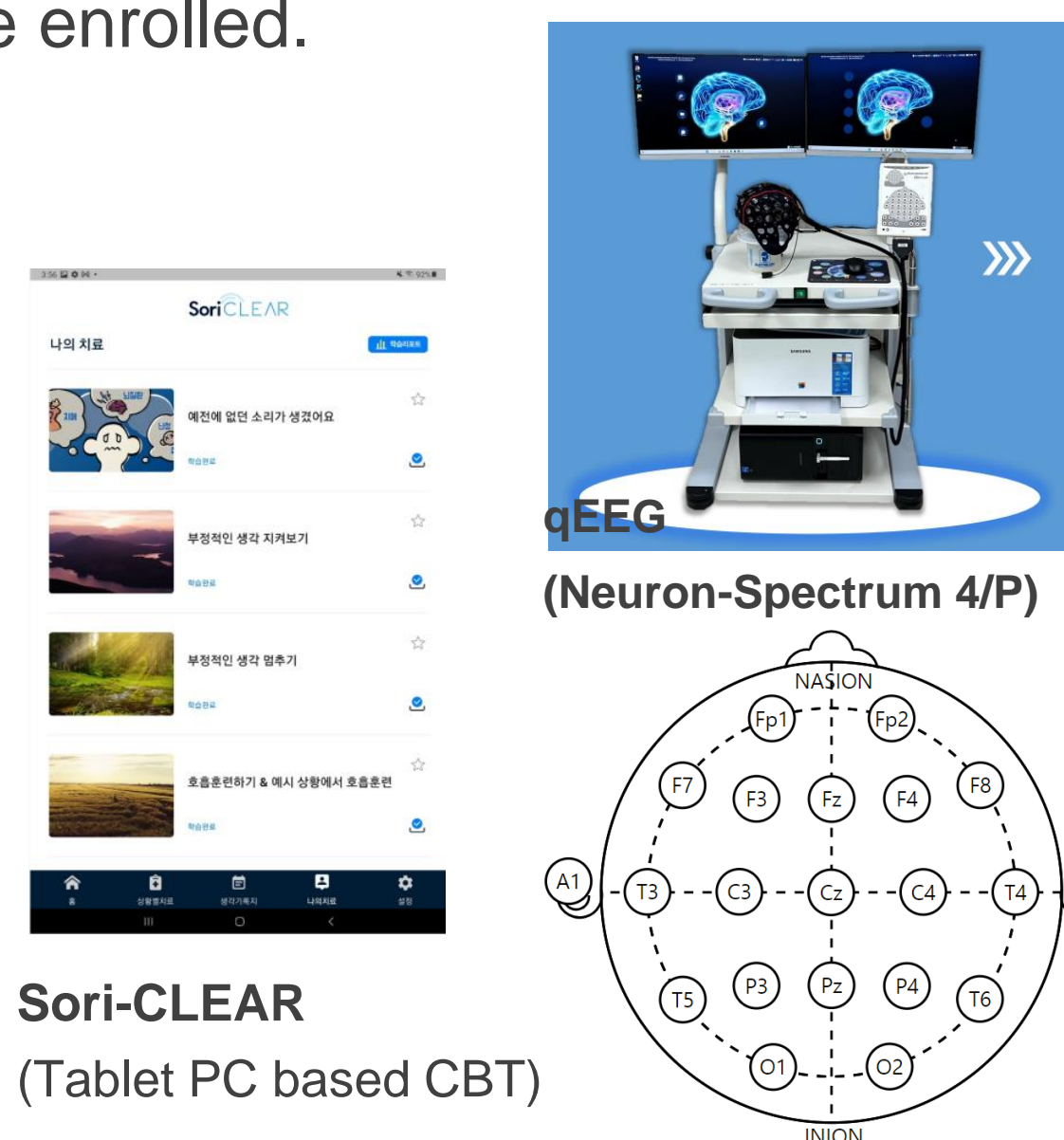
Introduction and Objectifs

The prevalence of tinnitus is 5.1% to 42.7% worldwide. Treatment for tinnitus is often taking antidepressants, intratympanic steroid injection, and sound therapy. Tinnitus retraining therapy (TRT) was presented based on the neurophysiological model of tinnitus. Cognitive behavioral therapy (CBT), which corrects unrealistic, distorted, and negative thoughts, is also being applied to tinnitus. In this study, we sought to determine the effects of simultaneous CBT and TRT to treat tinnitus. In addition to subjective survey on tinnitus, we sought to objectively analyze brain activity through quantitative electroencephalogram (qEEG).

Méthodes et Matériels

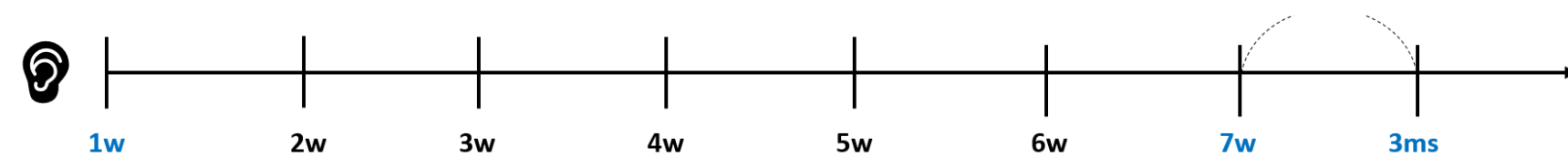
A randomized controlled study was conducted on adults aged 18 or older who visited Chonnam National University Hospital, a tertiary hospital, with tinnitus from July 2022 to September 2023. Patients with chronic tinnitus that lasts for more than 3 months were enrolled.

TRT included directive counseling and self-sound therapy using a tinnitus application using a smartphone. CBT was implemented using Neurive's Sori-CLEAR. For a total of 6 weeks, patients visited the clinic once a week. The control group received only TRT, and the experimental group received TRT and CBT simultaneously. A total of 23 people was enrolled in the control group and 23 people in the experimental group. The patients continued to take the medications they were previously taking. Tinnitogram, negative thinking VAS, tinnitus handicap inventory (THI), and qEEG were performed before and after treatment, and 3 months after the treatment, respectively. qEEG was measured using Neuron-Spectrum 4/P equipment and analyzed using Neuroguide's Neurostat and Neurobatch.



Sori-CLEAR (Tablet PC based CBT)

Demographics and Experimental schedule

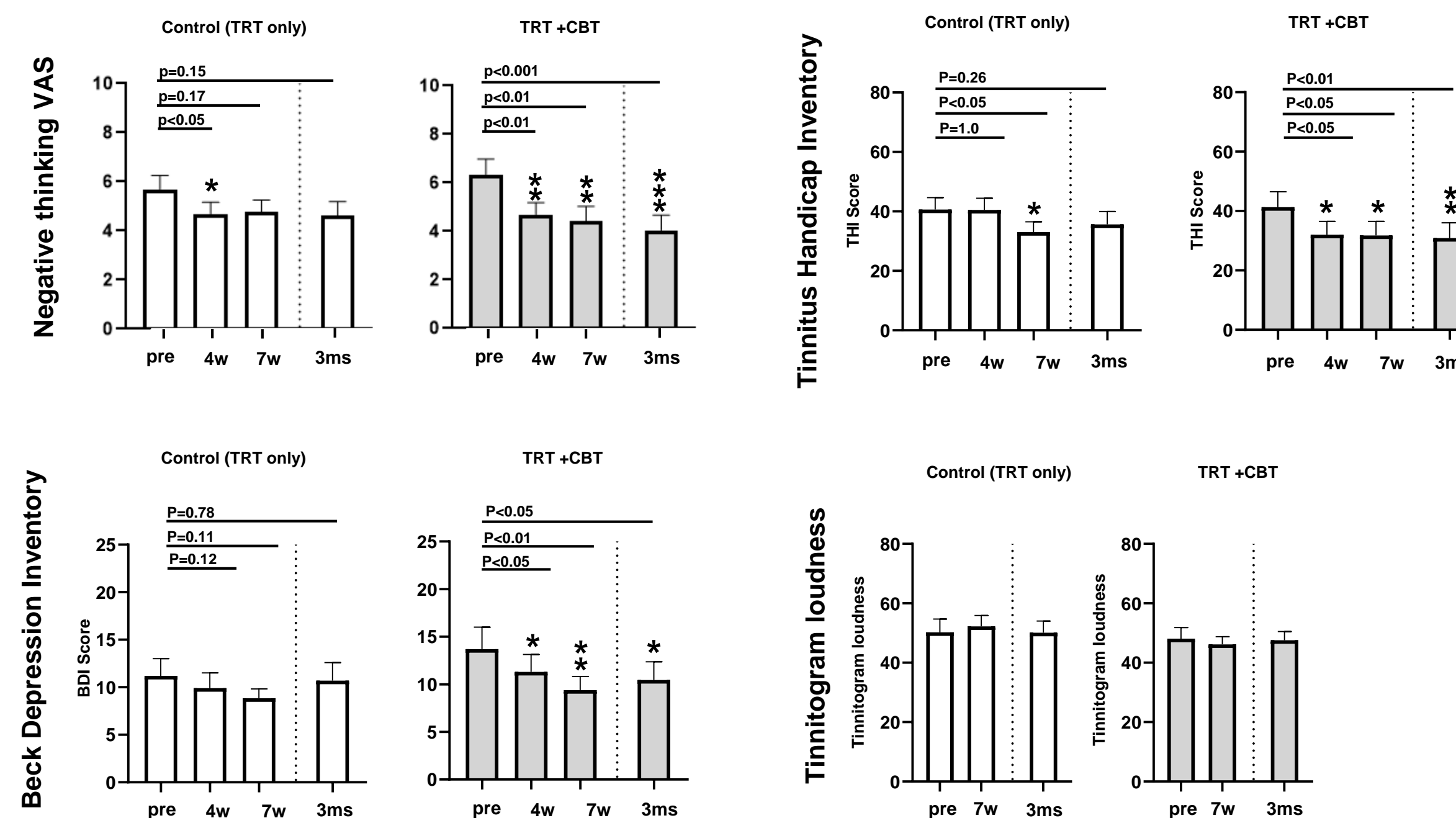


There were no differences in mean age, sex, duration of tinnitus and hearing level between two groups. CBT was done once a week for 6 weeks.

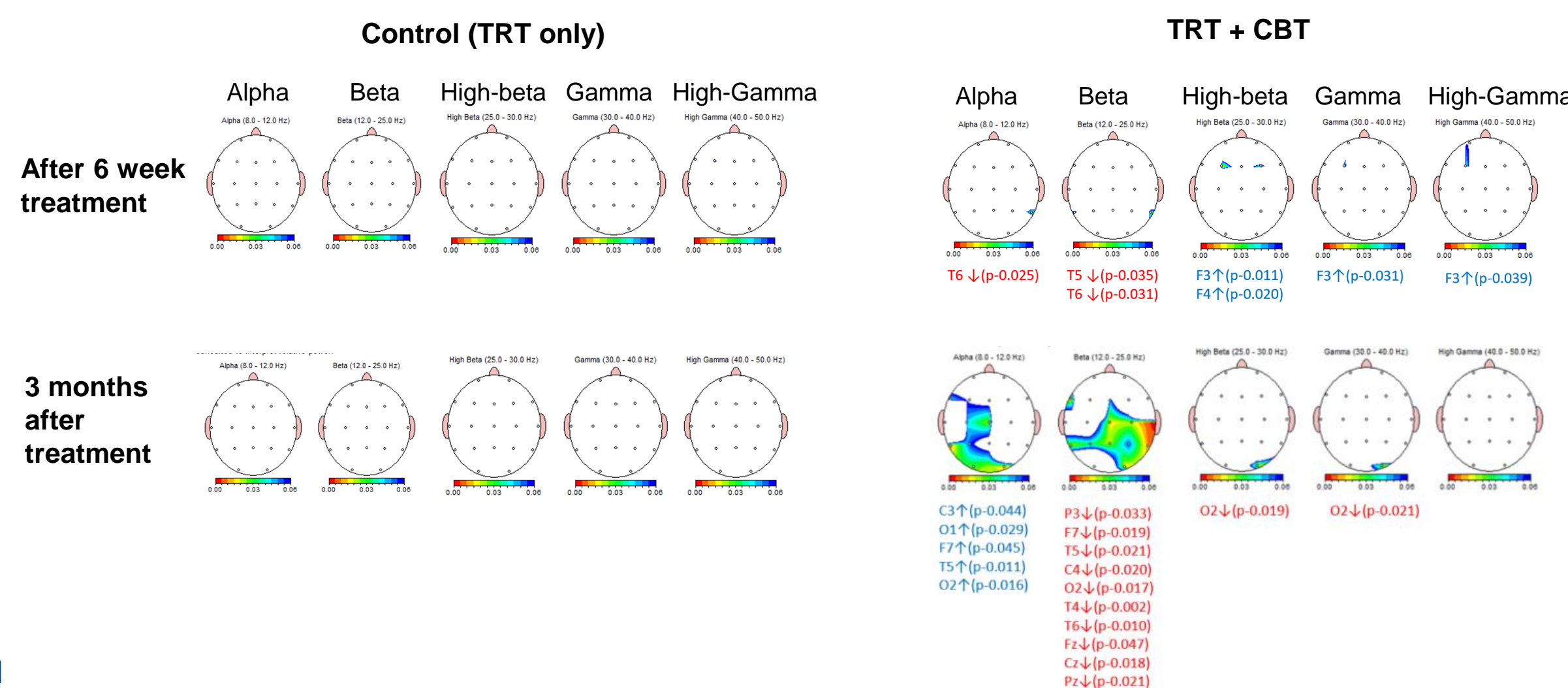
Table. Clinical and audiologic characteristics of each groups

	Control(n=23)	CBT(n=23)	P value
Age (mean)	61.87	60.4	0.6074
Sex (M/F)	8/15	6/17	0.5322
Duration of tinnitus (month)	33.04	39.17	0.6797
Hearing threshold (dB)	34.57	32.03	0.6357

Résultats



Negative thinking VAS score, Tinnitus handicap inventory(THI), Beck depression inventory (BDI) scores were all reduced in simultaneous TRT + CBT group after 6-weeks treatment. This effect was maintained at 3 months period after treatment. There were no change in the loudness by tinnitogram



Eye open, relative power qEEG results. There were no significant change in brain activity in the control group. In simultaneous TRT+CBT group, Alpha was elevated in C3, O1, O2, F7, T5. Beta was attenuated in P3, F7, T4, T5, T6, O2, Fz, Cz, Pz. Note that beta, high-beta and gamma activities are related to anxiety.

Conclusion

Simultaneous CBT and TRT treatment can more reduce tinnitus compared to TRT alone. The treatment effect can last at least up to 3 months. It also reduces brain activity related to anxiety. qEEG can be used to objectively measure changes in tinnitus treatment