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PO 108 Test-retest reliability of measures of neural excitability using threshold tracking

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Introduction/Background
Transcranial Magnetic Stimulation (TMS) and Nerve Excitability Testing (NET) can be used to assess central and peripheral nervous system excitability. The resting motor threshold (RMT) is a key parameter for evaluating cortical excitability, while NET provides insights into peripheral nerve function. Golden standard RMT estimation uses the manual Rossini-Rothwell (R-R) method. More recently, adaptive methods have been proposed as time-efficient alternatives, such as the threshold-tracking (T-T) method, including the 4-2-1 algorithm integrated into the QTrac Software. Despite their growing use, the test-retest reliability of automated T-T RMT estimation has not been verified. Similarly, the reliability of the full so-called "TROND" protocol for NET analysis, which also incorporates T-T, has not been tested. This study investigates the reliability of these T-T methods to establish their suitability for clinical and research applications. To warrant relevance to patient populations, e.g., people with amyotrophic lateral sclerosis, we analyzed the data of participants aged 40–70.

Method
Ten healthy subjects (three female, seven male, mean age 52.3 ± 10.1 years) participated in two identical test sessions spaced approximately seven days apart. TMS measures included T-T RMT with a 200 μV threshold and an automated version of the R-R RMT with a 50 μV threshold. NET was conducted with the 'TRONDNF 2024-05-20' protocol. Motor-evoked potentials and compound motor action potentials were recorded from the abductor pollicis brevis. The same investigator performed all measures, so Intraclass correlation coefficients (ICC3,1) were used to evaluate test-retest reliability.

Result
RMT 200 μV and RMT 50 μV demonstrated excellent reliability (ICC = 0.89 and ICC = 0.77, respectively), with the former showing a narrower confidence interval and smaller standard error of the mean. NET parameters varied in reliability, with some exhibiting excellent-to-good consistency, e.g., Rheobase (ICC = 0.91) and Stimulus-response/slope (ICC = 0.76), while others, e.g., Strength-duration\time constant (ICC = 0.58), were more variable.

Conclusion
Automated RMT estimation showed excellent reliability, especially using the T-T 4-2-1 method at the 200 μV threshold. The automated R-R method with a threshold of 50 μV performed similarly well and could be preferable for more sensitive assessments. NET demonstrated high reliability for selected parameters, reinforcing its utility for peripheral nerve assessments. It is crucial to identify less reliable parameters, as their interpretation for clinical and research applications requires caution. These findings support the implementation of automated RMT estimation and highlight key NET parameters in future studies.

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PO 109 Clinical efficacy of Nardostachys Jatamansi DC. as an adjunctive Ayurvedic therapy to escitalopram (SSRI) in major depressive disorder: a double-blind randomized controlled trial assessing heart rate variability, cortical excitability, and biochemical biomarkers

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Introduction/Background
Major depressive disorder (MDD), a common mental disorder, that affects over 280 million individuals worldwide, Despite the availability of conventional antidepressants, many patients experience partial remission or treatment resistance highlighting the need for alternative therapeutic approaches. Nardostachys Jatamansi DC., an Ayurvedic medicinal plant has demonstrated the potential to alleviate depressive symptoms. Depression is frequently associated with autonomic dysfunction, as evidenced by reduced heart rate variability (HRV), while transcranial magnetic stimulation (TMS) studies have elucidated alterations in cortical excitability. Biomarkers such as serum BDNF and serum glutamate receptor antibodies provided critical insights into the neurobiological mechanisms underlying depression. This study aims to evaluate the efficacy and mechanisms of Nardostachys Jatamansi DC. in the treatment of MDD.

Method
60 MDD patients, who were on Escitalopram for more than 2 months were randomized into 2 groups in to this double-blind study. Group A (n = 30) received Escitalopram with Jatamansi and group B (n = 30) received Escitalopram with placebo, both for 2 months. Patients were assessed using the Hamilton depression rating scale (HDRS), Montgomery Asberg depression rating scale (MADRS), Pittsburgh insomnia rating scale (PIRS), HRV, TMS, and biochemical measures including serum BDNF and serum glutamate receptor antibodies at baseline and after the 2 months of treatment period.

Result
Group A showed significant improvement in depression symptoms as reflected in reduced scores on clinical rating scales (HDRS : 21.77 ± 1.31 to 12.18 ± 2.48; MADRS: 34.37 (3.44) to 20 (4.35); PIRS: 131.5 (12.45) to 91.9 (12.63) $p < 0.001$) in Jatamansi group compared to placebo group. Heart rate variability (HRV) analysis revealed a substantial decline in sympathetic dominance (LF nu; $p < 0.001$), a significant increase in parasympathetic activity (SDNN, RMSSD, PNN 50, HFnu; $p < 0.001$), and a change in sympathovagal balance (LF/HF ratio; ($p < 0.001$) in group A compared to