Methods: Acute endotoxemia model was established in C57BL/6N mice intraperitonealy injected with 5 mg/kg *Escherichia coli* lipopolysaccharide (LPS). On Day 2 following LPS administration, LPS-injected mice and saline-treated controls were given single doses of olanzapine orally (p.o.) or intravenously (i.v.) or desmethylolanzapine (DMO) i.v. Concentrations and unbound fractions of olanzapine and DMO were measured in plasma samples and brain homogenates. Moreover, plasma biochemistry parameters and mRNA expression patterns were evaluated of pro-inflammatory cytokines, selected phase I and II drug-metabolizing enzymes and transporters in the liver, ileum and brain.
Results: Following p.o. olanzapine, the areas under the concentration-time curve (AUC) for olanzapine and DMO in the plasma were increased 3.8-fold and 2.6-fold ($P<0.05$) in LPS-injected mice vs. controls. The AUC for olanzapine in the brain homogenate was 5.2-fold higher ($P<0.05$). Brain DMO was hardly detectable in both groups. The penetration ratios ($K_{p,brain}$) of 8.5 and 6.3 confirmed that LPS increased the passage of olanzapine into the brain. Expression of mRNAs was decreased in the liver of CYP1A2 and UGT1a1/1a5 enzymes and Abcb1a, Bsep and Ntcp transporters and of ileal Abcb1a, whereas Abcb1a and Abcb1b in the brain and inflammatory cytokines and chemokines mRNAs in the liver were upregulated.
Conclusions: Investigation of olanzapine pharmacokinetics in endotoxemia mice clearly indicates a considerable increase in systemic and brain concentrations of the drug after oral administration. Further studies should clarify whether or not the inflammation-induced inhibition of metabolism and efflux transport results in brain overexposure to the drug and adverse effects in accutely infected patients treated with oral olanzapine.

Disclosure of Interest: None Declared

Psychoneuroimmunology

EPP505

Immune/inflammatory parameters as potential predictors of high-lethality suicidal behavior in individuals with/without psychiatric conditions: a retrospective single-center study

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Introduction: Accumulating research has suggested a possible role of the immune/inflammatory response system in the pathophysiology of suicidal behavior, more specifically of specifically high-lethality suicide attempts (SA). To count with reliable and affordable biological markers of high-lethality SA to complement clinical assessment for early detection of individuals at a high risk of committing suicide is thus mandatory.
Objectives: To assess if immune/inflammatory parameters may differ between suicide attempters with and without SA, taking into account the type of suicide method. The odds of repeating a high-lethality SA in the future will also be explored.
Methods: In this retrospective observational single center study, medical records of suicide attempters admitted to the Emergency Department at Vall d'Hebron University Hospital (Barcelona, Spain) between 2017-2021, will be reviewed. The following immune/inflammatory parameters (i.e., total and differential white blood cell count, platelet counts, C-reactive protein levels) will be extracted for comparisons between subjects without a history of previous suicide attempt (SA), and those with a history of previous SA. Additionally, the following ratios/indexes will be calculated as a proxy of subject's inflammatory status: neutrophil-to-lymphocyte ratio (NLR), basophil-to-lymphocyte-ratio (BLR), monocyte-to-lymphocyte ratio (MLR), platelet-to-lymphocyte ratio (PLR), systemic inflammatory response index (SIRI). Analyses will be controlled for clinical and sociodemographic variables, such as age, gender and/or primary psychiatric diagnosis. Analyses will be also stratified according to the attempt method. Moreover, the capability of the previously mentioned parameters to predict a high lethality SA or to commit suicide in the coming two years will also be evaluated.
Results: Results from the interim analysis will be presented at the congress.
Conclusions: Peripheral immune/inflammatory parameters may allow us to discriminate subjects at risk of committing suicide. In case of positive findings, immune/inflammatory parameters could be incorporated in the comprehensive evaluation of high-lethality SA in individuals admitted to the emergency setting, contributing to improve early detection of suicide risk.

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Psychosurgery and Stimulation Methods (ECT, TMS, VNS, DBS)

EPP507

Optimizing Pulse Frequency in Electroconvulsive Therapy

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Introduction: Effective seizure induction with minimal adverse effects in Electroconvulsive Therapy (ECT) are influenced by administered electrical pulse frequency. Optimized pulse frequency is key to ensure therapeutic efficacy and reduce side effects.
Objectives: This study examines electrical pulse frequency impact on neuronal excitability and seizure quality in ECT, guided by chronaxie and refractory periods.
Methods: A comprehensive literature review was conducted to assess neurophysiological properties affected by ECT and how different frequencies influence treatment outcomes.
Results: Neurons fire action potentials when membrane potentials reach a -55 mV threshold. Lower frequencies (20-32 Hz) balance depolarization and repolarization to trigger seizures without excessive neuronal firing. The neuronal absolute refractory period is 1-2 msec,

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and the relative refractory period is 2-4 msec. Lower frequencies optimize repolarization recovery.
ECT is clinically administered at 20-70 Hz. Studies show 20-32 Hz is effective at triggering seizures with optimal treatment outcomes. Lower Hz also minimizes tissue damage from reduced power. The total charge delivered is affected by current amplitude, pulse width, frequency, and train duration. Shorter pulse widths (0.3 ms) reduce total energy and minimize tissue heating.
The neuronal soma is sensitive to electrical stimulation. Chronaxie is the minimum time that an electric current is applied to stimulate a neuron. Chronaxie is 0.2-0.3 msec. Aligning pulse frequencies with these values ensures stimulation with reduced adverse effects. The soma exhibits a lower spike threshold and shorter refractory period when facing prolonged steady depolarization, making it highly sensitive to pulse frequencies that align with its chronaxie values.
In contrast, axons have a higher density of voltage-gated Na+ channels that allow quicker recovery and shorter refractory periods. This high density enables axons to rapidly transmit action potentials, facilitating efficient neuronal signal propagation. Shorter axonal refractory period means they handle higher frequencies more effectively, but optimizing the overall frequency for ECT must balance the excitability of both the soma and axons.
Studies indicate that frequencies around 20-32 Hz are effective in initiating convulsive activity, aligning well with the end of the stimulus train. Frequencies over 50 Hz may suppress ictal activity and be inefficient in seizure induction due to "stimulus crowding," with neurons stimulated during their absolute refractory period.
Conclusions: Optimizing ECT pulse frequency is vital to balance therapeutic efficacy and safety. Fine-tuning ECT's electrical parameters enhances patient outcomes. Lower frequencies (20-32 Hz) are more effective to induce seizures and minimize adverse effects. 20-70 Hz in ECT is most clinically used, and lower end Hz could optimize results. Further frequency range research could lead to improved ECT protocols.

Disclosure of Interest: None Declared

EPP508

A Randomized Controlled Trial Comparing the Efficacy of High-Frequency rTMS and Intermittent Theta-Burst Stimulation on Depressive and Anxiety Symptoms in Depressive Disorder

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Introduction: Depressive disorder is one of the most prevalent neuropsychiatric conditions in the world, significantly affecting both individuals and society. Despite numerous therapeutic options, many patients do not respond adequately to treatment, highlighting the need for novel approaches, in the case of this study repetitive transcranial magnetic stimulation (rTMS).
Objectives: The main objective of this study was to compare the therapeutic efficacy of high-frequency rTMS (HF-rTMS) and intermittent theta-burst stimulation (iTBS) in reducing depressive and anxiety symptoms in patients with depressive disorder.
Methods: This double-blind, randomized controlled trial was conducted at the psychiatric ward of Most Hospital. Patients (N=97) diagnosed with depressive disorder were randomly assigned to receive either HF-rTMS or iTBS both aimed at left dorsolateral prefrontal cortex. Data were collected using both self-assessment and clinician-rated questionnaires, such as the Zung Self-Rating Depression Scale (ZSDS), Beck Anxiety Inventory (BAI), Hamilton Depression Rating Scale (HAMD), and Hamilton Anxiety Rating Scale (HAMA), before and after 10 stimulation sessions.
Results: The analysis showed a significant reduction in depressive and anxiety symptoms after ten stimulation sessions using both HF-rTMS and iTBS across all applied questionnaires. Specifically, the ANOVA results for the ZSDS demonstrated a significant decrease in symptoms over time ($F=414$, $p<.001$), with a mean reduction of 6.54 points (95% CI=4.64–8.43). Similarly, the HAMD scores showed a significant reduction ($F=299.72$, $p<.001$), with a mean reduction of 7.83 points (95% CI=5.79–9.87). For anxiety symptoms, the BAI revealed a significant decrease ($F=389.26$, $p<.001$), with a mean reduction of 5.72 points (95% CI=4.45–6.99) and the HAMA showed a similar trend ($F=656.15$, $p<.001$), with a mean reduction of 7.39 points (95% CI=5.58–9.20).
No significant difference in efficacy was found between the two stimulation protocols across all measures: ZSDS ($F=0.142$, $p=0.237$), HAMD ($F=0.431$, $p=0.376$), BAI ($F=0.269$, $p=0.365$), and HAMA ($F=0.813$, $p=0.370$).
Conclusions: This study confirms that both HF-rTMS and iTBS are effective in reducing depressive and anxiety symptoms, with no significant difference in their efficacy across all measured outcomes after ten stimulations. However, iTBS offers distinct advantages over HF-rTMS, including a shorter stimulation duration and a lower incidence of side effects.

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Rehabilitation and Psychoeducation

EPP511

Individual selection of augmentative and alternative communication for people with mental disabilities

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Introduction: More than 150,000 adults with mental disabilities live in social shelters in Russia and almost 50% of them do not use speech for communication and can't communicate at all. Social institutions lack a system for training those in need of Augmentative and alternative communication (AAC).
Objectives: Development and testing of an algorithm for selecting AAC method for adults with mental disorders and severe speech communication disorders.
Methods: A questionnaire for people with mental disabilities who do not use speech for communication was developed and tested. It included questions accompanied by illustrations, photographs