Results: Social defeat stress as juveniles, even with 1-day exposure, induced robust and persistent deficits of social behaviors in relation to the unfamiliar ICR mouse, compared with the responses of mice exposed to the stress as adults. The stress did not affect anxiety-like behaviors during spontaneous locomotor activity in a novel environment and performance on the elevated plus-maze or marble-burying test. Additionally, the mice exposed to the stress as juveniles showed the increased serum corticosterone levels and suppressed neurogenesis in the subgranular zone of the dentate gyrus. The persistent deficits of social behaviors and suppression of neurogenesis were prevented by administration of mifepristone prior to the stress.

Conclusion: Deficits of social behaviors induced by social defeat stress as juveniles are more persistent than when exposure occurs as adults. The deficits are associated with suppression of neurogenesis in the hippocampus via activation of glucocorticoid receptors.

PM347
Postnatal exposure to valproic acid in postnatal day 2–4 rats shows deficit of social interaction
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Abstract
Previously, we have reported that postnatal exposure of valproic acid (VPA) stimulates proliferation of glial precursors during cortical gliogenesis. Because prenatal VPA treatment has inhibited neural cell proliferation and shown autistic-like behavior, we were wondering whether increased astrocyte affects neuropsychiatric behaviors. To study the effect of VPA at early postnatal period, Sprague Dawley (SD) pups were injected subcutaneously at dorsal neck region with 300 mg/kg VPA five times on postnatal day (PND) 2 to PND 4. For studying the VPA induced behavioral abnormalities, four different types of behavior tests were performed. We did open field locomotor test for locomotor activity at PND 21. VPA treated rat showed significantly hyperactive behavior (p<0.05). Moreover, the velocity of movement in VPA group increased with highly significant (p<0.01). Elevated plus maze test was performed for anxiety behavior at PND 22. VPA rat expressed significantly more anxiety behavior than control (p<0.05). Also, deficit of social interaction was measured by three chamber social interaction test by calculating Sociability (SI) and Social Preference (SPI) indices at PND 22. In both cases VPA group showed significantly lower interaction with strangers (p<0.05). But in case of passive avoidance test no significant differences were found between control and VPA treated group. Taken together, our results suggest that early postnatal exposure of VPA has been associated with gliogenesis and induced neurodevelopmental problems with some features of autism like behaviors.

PM349
Desynchronization of theta-phase gamma-amplitude coupling appeared during the mental arithmetic task in children with attention deficit/hyperactivity disorder
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Abstract
Objective: Recently, theta- phase gamma-amplitude coupling (TGC) measurement has received attention because it is a feasible method of assessing brain functions such as neuronal interactions. The purpose of this electroencephalographic (EEG) study is to understand the mechanisms underlying the deficits in attentional control in ADHD children by comparing the power spectra and TGC at rest and during a mental arithmetic task.

PM348
Association of peripheral BDNF level with cognition, attention and behavior in preschool children.
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Reference
1. Hyungju Park, Muming Poo. Neurtrophin regulation of neural circuit development and function. Neuroscience. 2013 14
Methods: Nineteen-channel EEGs were recorded from 97 volunteers (including 53 subjects with ADHD) from a camp for hyperactive children under two conditions (rest and task performance). The EEG power spectra and the TGC data were analyzed. Correlation analyses between the Intermediate Visual and Auditory (IVA) continuous performance test (CPT) scores and EEG parameters were performed.

Results: No significant difference in the power spectra was detected between the groups at rest and during task performance. However, TGC was reduced during the arithmetic task in the ADHD group compared with the normal group (F = 16.70, p < 0.001). The TGC values positively correlated with the IVA CPT scores but negatively correlated with theta power.

Conclusions: TGC, which reflects the degree of neuronal interactions among functional systems, provides information about an individual's attentional network. Our findings suggest that desynchronization of TGC appeared during the arithmetic task in ADHD children.

Significance: TGC in ADHD children is expected to serve as a promising neurophysiological marker of network deactivation during attention-demanding tasks.

Keywords: Quantitative electroencephalography (QEEG), Theta-phase gamma-amplitude coupling (TGC), Attention deficit/hyperactivity disorder (ADHD), Mental arithmetic calculation, Frontal-subcortical interaction

PM350
Moderating effects of depressive symptoms on the relationship
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Abstract

Introduction: Adolescent problematic internet use (PIU) is highly associated with depression and sleep problems. However, whether or not a direct relationship exists between PIU and sleep problems or whether depressive symptoms play a moderating role between the two is unclear. We hypothesized that 1) an adolescent group with problematic internet use (PIUG) would have more sleep problems compared with an adolescent group with normal internet use (NIUG); and 2) depressive symptoms would moderate the relationship between PIU. To verify this hypothesis, we examined various variables related to PIU, depressive symptoms and sleep problems and their interrelationships.

METHODS: A total of 802 students between 7th and 11th grade were recruited. Of the 802 students who participated in the study, 36 were excluded due to incomplete responses, which resulted in 766 subjects (483 boys, 283 girls). Measures: Young's Diagnostic Questionnaire (YDQ), Morningness-Eveningness (M-E) scale, Epworth Sleepiness Scale (ESS), Insomnia Severity Index (ISI), The Children's Depression Inventory (CDI).

RESULTS: The PIUG (N=152) had significantly higher ISI and ESS scores compared with the NIUG. The mean bedtime of the PIUG was significantly later than that of the NIUG, both on weekdays and weekends. Additionally, the PIUG had significantly higher depressive symptoms compared with the NIUG. We examined the moderating effect of depressive symptoms on sleep-related problems with PIU using the Baron and Kenny method. PIU itself did not affect the ISI or M-E. However, when depressive symptoms were combined with PIU, PIU had an effect on the ISI and M-E, suggesting that depressive symptoms moderated the interaction between PIU and ISI or M-E.

CONCLUSION: Adolescent sleep problems may arise from the interactions of various factors such as PIU, depression and normal physical and hormonal changes. Therefore, the causes will need to be explored in a more multi-dimensional way with the collaboration of experts in related areas.

PM351
Efficacy and Safety of Sansoninto for Insomnia in Child and Adolescent Patients: An Open-Label Study
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Abstract

Background: Problems of sleep initiation and maintenance occur in 15% to 25% of children and adolescents. Insomnia refers to loss of daytime function resulting from unsatisfactory sleep. The symptoms of insomnia include fatigue, inattention, irritability, lack of energy, and anxiety.

Objective: The efficacy and safety of sansoninto (SNT), Japanese herbal medicine, was examined for insomnia in child and adolescent patients.

Methods: Thirty-one children and adolescents with sleep disturbance meeting DSM-IV-TR diagnostic criteria for psychiatric disorders were treated openly for four weeks with SNT (2.5 – 5 g) at bedtime. Efficacy was analyzed using a repeated measures methodology. The primary outcome was the Pittsburgh Sleep Quality Index (PSQI). The secondary outcomes were the Insomnia Severity Index (ISI), Athens Insomnia Scale (AIS), Clinical Global Impression-Improvement (CGI-I), and change of dosage of benzodiazepine hypnotics (diazepam equivalent).

Results: Significant symptom reduction was observed on all parameters (PSQI, ISI, AIS, CGI-I, and dosage of benzodiazepine hypnotics). No withdrawal involved treatment-related adverse events.

Conclusion: Data from this 4-week open-label study suggests SNT was an effective and generally well tolerated treatment for insomnia symptoms in this sample of child and adolescent patients with insomnia.

Trial Registration: controlled-trials.com Identifier: UMIN000014156

Key Words: children and adolescents psychiatric disorder, sansoninto (SNT), insomnia, Japanese herbal medicine.

PM352
Association of pro-inflammatory cytokines with tic disorders in children and adolescents
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Abstract

Background: Although it is widely believed that immune dysfunction is involved in the pathogenesis of tic disorders, it is not completely defined if systemic inflammatory responses are altered in these patients.

Methods: 29 children and adolescents with tic disorders and 6 healthy comparison subjects were enrolled. These samples