PT702. Hippocampal subfields volume reduction in high schoolers with previous verbal abuse experiences

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Accessibility
Conclusions: The Klüver–Bucy syndrome mostly occur after bilateral temporal lobe damage. It also results from disruption of pathways connecting between the dorsomedial thalami and other limbic areas which essential for cognitive functions, such as memory and regulation of impulses and emotions. In this case, it damaged the limbic system by involvement of bilateral basal ganglion, instead of direct lesions on the temporal lobe.

Reference

PT700
Personality traits and associated volume abnormality of the amygdala in individuals at clinical high risk for psychosis
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Abstract
Personality factors are linked to emotion and associated with the amygdala. Personality abnormalities and decreased amygdala volumes are well-known features of schizophrenia. However, little is known in individuals at clinical high risk (CHR) for psychosis. This study investigated the personality traits and the associated amygdala volume abnormality of CHR. A total of 36 CHR, 36 age-, sex-, education year- matched healthy controls (HC) and 25 subjects at first episode psychosis (FEP) participated in self-assessments of the Korean version of NEO Personality Inventory-Revised (NEO-PI-R) and the magnetic resonance imaging (MRI).

The volumes of the left and right amygdala were extracted from Freesurfer. CHR displayed significantly higher neuroticism (F = 26.098, P < .001) and lower agreeableness (F = 7.839, P < .01) compared to HC and FEP, and lower extraversion (F = 29.463, P < .001) and conscientiousness (F = 8.926, P < .001) compared to HC in NEO-PI-R. FEP and CHR had smaller volumes of the left amygdala compared to HC (F = 5.659, P < .01). Extraversion of NEO-PI-R was significantly correlated negatively with the volume of the left amygdala at CHR (r = -.447, P < .01). This correlation was not found at HC and FEP. The abnormalities on personality factors including high neuroticism and low extraversion, and the volume reduction the left amygdala are being with CHR. The smaller amygdala volume is, the more self-awareness of the emotional impairment seems to be impaired or the more faking of a good attitude seems to be increased at CHR. These data support the neurobiological factors as well as innate characteristics or stressful situations may affect the abnormality on personality traits at CHR. Our results suggest the psychological and neurobiological interventions will be needed for the effective treatment of CHR.

Keywords: NEO-PI-R, amygdala, high risk, psychosis

PT701
The FKBP5 variant rs1360780 modulates functional network connectivity in a non-demented elderly Han population
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Abstract
Objective: The common single nucleotide polymorphism (SNP) rs1360780 (C/T) of the FK506 Binding Protein 5 (FKBP5) gene is involved in regulation of glucocorticoid receptor sensitivity and has association with hippocampal function and cognitive ageing. This study investigated the effect of FKBP5 rs1360780 on functional connectivity (FC) and cognitive performance in non-demented Han elderly people.

Methods: Resting fMRI scanning, genotyping, and cognitive evaluation using the Mini-mental state examination and the Wechsler digit span forward and backward test were carried out in 83 non-demented elderly individuals (mean age: 66.6, range: 60–85). An independent component analysis (ICA) of resting fMRI data was carried out. Multiple linear regression analysis were performed to determine the relationship between cognitive performance and FC in different genotypic groups.

Results: There were no significant differences in the demographic and neuropsychological characteristics between the 38 T-allele carriers (C/T, T/T) and 45 non-T-allele carriers (C/C). For the FC analysis, we identified significant differences in salience network (SN; anterior hippocampal formation, subcortical network and dorsal anterior cingulate) and default mode network (DMN; temporal-parietal junction, precuneus, and angular gyrus) between T allele carriers and non-carriers (p=0.002, 0.010, respectively). Connectivity was positive in T-allele carriers but negative in non-carriers. Moreover, DMN connectivity was positively correlated with digit span forward scores in T-allele carriers (r=0.118, p<0.05).

Conclusion: Current study suggested that FKBP5 rs1360780 may modulate brain SN and DMN in the elderly population and potentially affect cognitive ageing through its effect on brain connectivity.

Keywords: Aged, Default mode network, FKBP5, fMRI, Polymorphism, Salience network

PT702
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Abstract
Structural alterations in hippocampus and white matter tracts have been frequently reported in adults with...
maltreatment histories. Less is known about maltreatment-associated alterations in these structures during adolescence. Hippocampal subfield volume and white matter connectivity measures were assessed in 31 first-year male high school students with various degrees of exposure to parental and peer verbal abuse (VA). Volumes of left hippocampal subfields CA1 and subiculum were negatively correlated with previous VA experiences. Increased mean diffusivity (MD) of the splenium of the corpus callosum was related to high VA score across all subjects. The high VA group showed significant volume reduction in the left CA1 and left subiculum compared to the low VA group. There was an inverse relationship between volume of CA1 and subiculum and MD of the splenium. Exposure to parental and peer VA may affect development of left hippocampus and posterior corpus callosum and be discernible during adolescence.

PT703

Sleep under exposure to dim light of 10 lux for one night could decline one's brain activation during working memory task: one evidence from fMRI study

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Abstract

This study was conducted to investigate the effect of the exposure to dim light during sleep on the brain activation while conducting tasks requiring working memory. 23 young healthy subjects participated in this study. The subjects were instructed to sleep in a polysomnography room with no light exposure on the first night and under a dim light condition of 5 lux or 10 lux on the second night. After each of the first and the second night, the participants underwent the functional magnetic resonance imaging (fMRI) while performing the n-back task. Statistical parametric maps of brain regions showed more activation in the right inferior frontal gyrus (p FWE-corrected = 0.014) before exposure, compared to the post exposure to 10 lux light during the n-back task, although the change of the response accuracy after the light exposure was not significant in the n-back task. The decreases of fMRI activity in right inferior frontal gyrus (p FWE-corr = 0.033) and left frontal gyrus (p FWE-corr = 0.010) areas were more significant during the 2 back task rather than 1 or 0 back task in the group exposed to the light of 10 lux. To our knowledge, this is the first report on the decline of brain activation using the fMRI during N back task after sleep with an exposure to dim light. The dim light exposure might influence the brain function related to cognition although we could not feel the significant impairment in the subjective symptoms.

Keywords: dim light at night, working memory, fMRI, brain activation

PT704

Childhood environment effects on episodic memory brain function

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Abstract

Background: Urban childhood environments may be related to neuropsychiatric disorders. In this China-US collaborative study, we aimed to explore the underlying mechanisms of gene and childhood environment effects on brain function and neuropsychiatric risk. This leverages on dramatic urbanization and rural-urban migration since the 1980s in China. Here, we examined episodic memory encoding and retrieval of aversive and neutral pictures in individuals with different rural-urban childhoods.

Methods: e examined subjects who were currently living in urban cities and have similar gender, education and current social economic status, but have had different urban or rural childhoods. In particular, we studied subjects who moved to cities from rural areas after age 18 (117 subjects) and those who have always lived in cities (90 subjects). In the episodic memory paradigm scanned in a 3T GE MRI, subjects rated whether blocks of neutral or aversive International Affective Pictures were indoors or outdoors in the encoding session, and whether the pictures have been seen before in the retrieval session. Data were analyzed in Statistical Parametric Mapping 12.

Results: Both subject groups had similar demographic and behavioral results. In the encoding and retrieval tasks, subjects revealed stronger activation when processing aversive relative to neutral pictures in hippocampus, amygdala, putamen and cortex. (p<0.001, uncorrected). Rural childhoods was associated with relatively increased activation in neutral and aversive conditions at hippocampus, amygdala, and frontal cortex in encoding and retrieval. These effects were accentuated in the aversive minus neutral contrast during encoding.

Discussion: Childhoods in rural and urban environments appear associated with physiological differences in the neural processing of picture scenes. The childhood environment effects were accentuated in the encoding of aversive pictures at the hippocampus, amygdala and frontal cortex. These may relate to differing neuropsychiatric vulnerabilities of rural and urban childhoods.

Keywords: childhood environment, episodic memory, fMRI, rural/urban, hippocampus

PT705

Childhoods in rural and urban environments may be related to neuropsychiatric disorders. In this China-US collaborative study, we aimed to explore the underlying mechanisms of gene and childhood environment effects on brain function and neuropsychiatric risk. This leverages on dramatic urbanization and rural-urban migration since the 1980s in China. Here, we examined episodic memory encoding and retrieval of aversive and neutral pictures in individuals with different rural-urban childhoods.