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

The Harvard community has made this article openly available. Please share how this access benefits you. Your story matters.

Citation

Published Version
doi:10.1093/ijnp/pyw044.702

Citable link
http://nrs.harvard.edu/urn-3:HUL.InstRepos:34492865

Terms of Use
This article was downloaded from Harvard University’s DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA
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

Kyung-Ok Lim1, Tae Young Lee1, Je-Yeon Yun1, Minah Kim1, Sung Nyun Kim2, Jun Soo Kwon2,3,4*
1 Department of Neuropsychiatry, Seoul National University Hospital, Seoul, Republic of Korea 2 Department of Psychiatry, Seoul National University College of Medicine, Seoul, Republic of Korea 3 Department of Brain and Cognitive Sciences, Seoul National University College of Natural Sciences, Seoul, Republic of Korea 4 Institute of Human Behavioral Medicine, SNU-MRC, Seoul, Republic of Korea

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

Mu-En Liu1, Ching-Po Lin1, Shih-Jen Tsai1

Abstract
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 analyses 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
Hippocampal subfields volume reduction in high schoolers with previous verbal abuse experiences

Authors & Affiliations:

- Sang Won Lee, M.D.1,2, Jae Hyun Yoo, M.D.1,2, Ko Woon Kim, M.D.1,2, Dongchan Kim, M.S.1,2, HyunWook Park, Ph.D.1,2, Jeewook Choi, M.D., Ph.D.1,2, Martin H. Teicher, M.D., Ph.D.1,2 and Bumseok Jeong, M.D., Ph.D.1,2
- 1Laboratory of Clinical Neuroscience and Development, Graduate School of Medical Science and Engineering, KAIST, Daejeon, Republic of Korea. 2Department of Psychiatry, Kyungpook National University School of Medicine, Daegu, Republic of Korea. 3Department of Electrical Engineering, KAIST, Daejeon, Republic of Korea. 4Department of Psychiatry, Daejeon St. Mary’s Hospital, The Catholic University of Korea, College of Medicine, Daejeon, Republic of Korea. 5Developmental Biopsychiatry Research Program, McLean Hospital, Belmont, Massachusetts, United States of America. 6Center of Optics for Health Science, KAIST Institute, KAIST, Daejeon, Republic of Korea.

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
Seung-Gul Kang1, Ho-Kyoung Yoon1,2, Chul-Hyun Choi1, Soowook Kwon1, Young-Min Park3, Eun-Il Lee4, Leen Kim2, Heon-Jeong Lee5
1Department of Psychiatry, Gil Medical Center, Gachon University, School of Medicine, Incheon, Korea 2Department of Psychiatry, Korea University College of Medicine, Seoul, Korea 3Department of Anatomy, Korea University College of Medicine, Seoul, Korea 4Department of Psychiatry, Ilsan Paik Hospital, Inje University College of Medicine, Goyang, Korea 5Department of Preventive Medicine, Korea University College of Medicine, Seoul, Korea
These individuals contributed equally to this article as co-first authors.
Corresponding author.
Heon-Jeong Lee, MD, PhD, Department of Psychiatry, Korea University College of Medicine, 73 Inchon-ro, Seongbuk-gu, Seoul 136–705, Republic of Korea
Tel: +82-2-920-6721, Fax: +82-2-929-7679, E-mail: leehjeong@korea.ac.kr

Abstract
This study was conducted to investigate the effect of the exposure to dim light during the 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 test. 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
Xiao Zhang1,2, Hao Yan1,2, Shefali Shah1, Zheng Dong1,2, Guang Yang3, Xin Zhao2,3, Jian Zhu1, Jimin Liao1,2, Tim Muse4, Sisi Jiang5,6, Xiaoxi Zhang1,2, Jing Li2, Liuwei Cai1,2, Venkata S. Mattay1, WeiHua Yue1,2, Daniel R. Weinberger1, Dai Zhang4,5,6,7, Hao Yang1
1Institute of Mental Health, Sixth Hospital of Peking University, Beijing 100191, China; 2 National Clinical Research Center for Mental Disorders, Ministry of Health (Peking University), Beijing 100191, China; 3 Key Laboratory for Mental Health, Ministry of Health (Peking University), Beijing 100191, China; 4 Lieber Institute for Brain Development, Johns Hopkins Medical Campus, Baltimore, MD, USA; 5 Peking University-International Data Group/McGovern Institute for Brain Research, Peking University, Beijing 100871, China; 6 Peking-Tsinghua Center for Life Sciences, Peking University, Beijing 100871, China; 7 Shenzhen Key Laboratory for Neuronal Structural Biology, Shenzhen Peking University-Hong Kong University of Science and Technology Medical Center, Shenzhen, 518035, China.

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.