

The authors make a review about the different results in studies with cerebral SPECT in Schizophrenia, in terms of changes in cerebral regional blood flow, with and without activation tasks. They enhance the actuality and importance of this issue, and reinforce the idea that functional neuroimaging techniques may be important in identifying pathophysiologic processes in Schizophrenia.

P0365

Pet scan and schizophrenia(dementia praecox) (case study)

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Neuroimaging research has contributed to the understanding of structural and functional differences between the brains of people suffering from Schizophrenia and those of healthy people. However, the likely pathophysiological heterogeneity of Schizophrenia pose major difficulties to research, differential diagnosis (namely, with Alzheimer-type Dementia) and treatment. In this case study, regarding a female schizophrenic patient, using brain F-18 FDG (5 mCi) Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI) scans, it is presented the identification of impaired and preserved neural system structure and function.

P0366

The neural correlates of facial affect recognition in patients with bipolar disorder, and their unaffected siblings

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Background: Bipolar disorder (BD) is characterised by emotional dysregulation; relatives of BD patients have a high rate of affective symptoms, and therefore abnormalities in emotional information processing are likely to be part of the genetic predisposition to BD. Examination of unaffected siblings of patients with BD can contribute to determining features of the BD phenotype which are related to familial predisposition as opposed to disease expression.

Aims: To identify the neural correlates of facial affect recognition in BD patients and their unaffected siblings.

Methods:

Event-related functional magnetic resonance imaging (fMRI) EPI data was collected with a 1.5T scanner. Blood oxygenation level-dependent (BOLD) data was obtained from 41 BD type I patients, 22 of their unaffected siblings and 51 matched healthy controls during recognition of fearful, angry and sad facial expressions. A random effects analysis was implemented using SPM5 (<http://www.fil.ion.ucl.ac.uk/spm>).

Results: BD patients showed reduced prefrontal cortex (PFC) activation, when compared to controls and siblings, with evidence of differentiation in location and laterality of activation maxima across different facial expressions. Regardless of valence, patients showed reduced extrastriate cortex activation. During angry faces, when compared to controls, siblings showed reduced activation in posterior cingulate gyrus, and during sad faces, enhanced activation in left ventral PFC and right parahippocampal gyrus.

Conclusions: Dorsolateral PFC (BA47) activation may represent a marker for genetic risk for BD. During sad faces, siblings showed greater activation of this region than HC, whilst BD patients showed reduced activation. This is consistent with previous findings implicating this region in BD.

P0367

Spect comparison of functional cerebral alterations between monopolar depression and comorbid alcohol dependence

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The development of human brain imaging has resulted in a number of techniques that allow unprecedented insights into the in vivo metabolic and neurochemical processes of the brain. Single positron emission cerebral tomography (SPECT) is a nuclear medicine technique that can be used for measuring perfusion and blood flow in patients affected with psychopathology. The aim of the study was to compare sole depressed patients and those with comorbid alcohol dependence in terms of the functional alterations detected by single positron emission scan (SPECT). For this, 27 SPECT imaging studies performed at Hospital Clínico Pontificia Universidad Católica, of selected patients, were collected and categorized by group. First group composed by depressed patients and second group of patients having alcohol dependence in addition to depression. Selected studies were coregistered, normalized and smoothed for standarization before statistic analysis was performed using MatLan7.1 software with SPM5 module. Mean blood flow in brain areas were compared between groups, with significant statistical difference at $p < 0.01$.

Results show significantly less blood flow in the group with alcohol dependence in Brodmann Areas 4,6,8,9,45 and 46 of the frontal lobe and Brodmann Areas 2,3,4,5,7 and 40 of the parietal lobe ($p < 0.01$). Furthermore, the group with alcohol dependence showed increased blood flow in frontal lobe's Brodmann Area 10, temporal lobe's Brodmann Areas 13,20,22, cerebellum, uncus and thalamus ($p < 0.01$). We conclude that alcohol dependence as comorbid condition in depressed patients determines an additional decrease in the mean blood flow of prefrontal and temporal lobes.

P0368

The effects of gender and COMT Val158met polymorphism on fearful facial affect recognition: An fMRI study

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The functional Catechol-O-methyltransferase (COMT Val 108/158 Met) polymorphism has been shown to have an impact on tasks of executive function, memory and attention and recently, tasks with an affective component. As estrogen may downregulate COMT, we were interested in the effect of gender, COMT genotype and the interaction between these factors on brain activations during an affective processing task. We used functional MRI to record brain activations from 74 healthy subjects who engaged in a facial affect recognition task; subjects viewed and identified fearful faces compared to neutral faces. We found a significant effect of gender on brain activations in the left amygdala and right superior temporal gyrus, where females demonstrated increased activations over males. Within these regions, female val/val carriers showed greater activity compared to met/met

carriers, while male participants with a met/met allele showed greater deactivations compared to val/val carriers. There was no main effect of the COMT polymorphism, gender or genotype by gender interaction on task performance. We propose that the observed effects of gender and COMT allele on brain activations arise from differences in dopamine levels in these groups and that the gender differences and gender genotype interaction may be due to the downregulation of COMT by estrogen.

P0369

Increase of prefrontal cortex blood flow during the performance of the computer version trail making test – the second report

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We have reported a blood flow increase in the prefrontal cortex during the performance of the computer version TMT. Although TMT-A was first performed and followed by TMT-B in the previous study, the order was reversed in the present study, i.e., TMT-B was first performed and then followed by TMT-A, and differences in the change of blood flow were compared between the two modes of TMT.

Nine healthy student volunteers (20.7 ± 1.6 yr) performed two different sets of TMT-B. After a resting period of 30 sec, they performed four different sets of TMT-A. Changes of oxyHb and deoxyHb were monitored by 22-channel NIRS from 30 sec before the start of TMT-B through 30 sec after the end of TMT-A. The mean changes of blood flow over a period of 10 sec just before the start of TMT-B and TMT-A, and over a period of 100 sec after the start of TMT-B and TMT-A were determined.

The increase of oxyHb was prominent in the right lateral prefrontal cortex.

The results suggest that the blood flow increases in the prefrontal cortex during the start of either TMT-A or TMT-B. The location of blood flow increase did not change whether TMT-B was performed first or after TMT-A. Therefore, the blood flow increase observed only in the right prefrontal cortex in the previous study could not be due to familiarization of the test. In contrast, TMT-A apparently exhibits a familiarization effect, since blood flow increase was not observed when TMT-A was performed after TMT-B.

P0370

Increase of prefrontal cortex blood flow during the performance of the computer version trail making test – the first report

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We measured concentration changes of oxyHb and deoxyHb in the prefrontal cortex during the performance of the computer version Trail Making Test (TMT) by multichannel NIRS using near infrared light pairs which are more sensitive for detecting changes of oxyHb and deoxyHb.

Sixteen healthy student volunteers performed four different TMT-A sets, and following 30 a sec resting period, two different TMT-B sets. Changes of oxyHb and deoxyHb were monitored by 22 channel NIRS from 30 sec before the start of TMT-A through 30 sec after the end of TMT-B. The mean changes in subjects over a period of 10 sec

just before the start of TMT-A and TMT-B, and a period of 50 to 60 sec after the start of TMT-A and TMT-B were determined. OxyHb increased while deoxyHb decreased in the bilateral prefrontal cortices during the performance of TMT. The increase of oxyHb was prominent in the right lateral prefrontal cortex, especially during TMT-A.

On the other hand, deoxyHb significantly decreased in the bilateral prefrontal cortices especially during TMT-A.

The results suggest that blood flow increases in the prefrontal cortex during the performance of the computer version TMT.

P0371

Functional imaging of neural responses to emotional interference before and after cognitive behavioural therapy in major depression

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Background: The present functional magnetic resonance imaging (fMRI) study investigated neural changes in relation to mood biased processing in depression, before and after cognitive behavioral therapy (CBT) using an emotional Stroop task.

Methods: Sixteen unmedicated patients (mean age 40 years), fulfilling DSM-IV diagnosis for unipolar major depression underwent fMRI, prior to and after 16 once-weekly sessions of CBT. Sixteen matched healthy volunteers were scanned at similar time intervals. In an emotional Stroop task negative and neutral words were presented in various colors and volunteers had to name the color of words. Latencies were recorded to determine behavioral emotional interference effects. MRI images were acquired using clustered image acquisition. Whole-brain and region of interest analysis examined the neural basis of interference and mood biased processing.

Results: At baseline patients displayed increased latencies during color naming negative words, in comparison to neutral words and in relation to healthy volunteers. After treatment, latencies did not significantly differ between groups. With regard to neural activity, depressed patients showed increased activation at baseline in amygdala, dorsolateral prefrontal cortex (DLPFC), and ventrolateral prefrontal cortex (VLPFC), which normalized after CBT. Additionally, hyperactivation in the rostral anterior cingulate at baseline was positively correlated with symptom reduction after CBT.

Conclusions: Evidence was found for an emotional interference effect during acute states of depression which improved following CBT. The neural basis is associated with increased activity in the amygdala, DLPFC and VLPFC which normalized after treatment. CBT seems to affect behavioral biases and neural circuits involved in processing negative information.

P0372

The effect of repetitive transcranial magnetic stimulation add on serotonin reuptake inhibitors in panic disorder

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