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Background and Aims: Cannabis is the world's most widely used illicit drug. It can impair verbal learning and induce psychosis, both acutely and possibly following long term use. But, where cannabis acts in the brain to impair verbal learning and induce psychotic symptoms is unclear. The aim of this study was to clarify how one of the main psychoactive ingredients of cannabis, delta-9-tetrahydrocannabinol (THC) acts on the brain to impair verbal learning and induce psychotic symptoms.

Methods: 15 healthy males with minimal exposure to cannabis, were studied on 2 occasions approximately 1 month apart, following oral administration of 10mg of THC or placebo 1 hour prior to scanning, in a double-blind design. MR images were acquired on a 1.5T GE camera while subjects performed a Verbal paired associates task with separate encoding followed by retrieval conditions, with the conditions repeated in the same sequence 4 times. We examined the main effects of drug, task and drug-task interactions.

Results: Administration of THC abolished the normal linear decrement in parahippocampal activation across successive encoding blocks and was associated with a trend for impaired word recall. Administration of THC also altered the normal time-dependent change in ventral striatal activation during retrieval of word pairs which was directly correlated with concurrently induced psychotic symptoms.

Conclusions: These results suggest that impairment in learning and verbal memory associated with cannabis use may be mediated through its action in the medial temporal cortex while psychotic symptoms may be induced through its action in the ventral striatum.

P0362

Distinct language dimensions correlate with superior temporal gyrus and Heschl's gyrus in schizophrenia and healthy controls

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Background and Aims: Language disturbances, such as impoverishment, disorganization and dysregulation, are a prominent feature of schizophrenia. Several neuroimaging studies have suggested the superior temporal gyrus (STG) as a likely anatomical substrate of language deficits in schizophrenia. The aim of this study was to verify a correlation between structural measures of STG and Heschl's gyrus (HG) and language dimensions.

Methods: An extensive language examination battery, which included narrative and conversational expressive tasks, and syntactic and pragmatic comprehension tests, was administered to 23 schizophrenia patients (mean age±SD= 40.30±11.60) and 21 normal controls (mean age±SD= 42.19±11.05). All subjects also underwent a 1.5T MRI session, and STG and HG were manually traced and volumes were obtained, bilaterally, using Brains2.

Results: Specific language deficits were shown in subjects with schizophrenia compared to healthy individuals ($p<0.001$), particularly in verbal fluency, syntactic complexity, lexical diversity and metaphor/idiom comprehension. Interestingly, speech fluency significantly directly associated with left STG gray matter volumes in controls ($r=0.46$, $p=0.03$) but not in patients ($r=-0.27$, $p=0.21$). In contrast, complex syntax and word diversity significantly correlated, respectively, with left and right HG volumes in schizophrenia patients ($r=0.45$, $p=0.02$; $r=-0.47$, $p=0.02$), but not in controls ($p>0.05$).

Conclusions: This study confirmed a widespread impairment of language in schizophrenia. Interestingly, distinct language dimensions differently correlated with STG-HG volumes in patients with schizophrenia and controls, particularly with regard to verbal fluency and syntactic measures.

P0363

Asymmetry of language activation in families with multiple incidence of schizophrenia

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Progress in neuroimaging contributed greatly to the schizophrenia research, including investigation of the etiological factors. We tested the hypothesis that lack of the normal asymmetry of language activation is familial and that it can be found in both schizophrenic and non-schizophrenic family members. In particular, we wanted to know whether relatives who are supposed to be transmitting liability to the illness also demonstrate the loss of asymmetry of language activation. We studied 5 families with at least two members affected with schizophrenia. Functional imaging (fMRI) was used to study cortical activation during a verbal task in Broca's area and its contralateral homologue in subjects with schizophrenia and their both parents who never manifested any psychotic symptoms but one of them had mother or father with schizophrenia. Schizophrenia patients showed lack of asymmetry of language activation. Parents without schizophrenia among their elderly relatives showed normal asymmetry of language activation. Three of parents who supposedly transmit liability to the illness demonstrated the loss of asymmetry of language activation. Our results suggest that lack of the normal asymmetry of language activation could be one of the inherited etiological factors of schizophrenia.

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P0364

Controversies about utility of cerebral spect in schizophrenia research

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The visualization of SPECT images (single photon emission computed tomography) with ^{99m}Tc (technetium) — HMPAO (hexamethylpropyleneamine oxime) is a reliable technique to evaluate the different patterns of cerebral regional blood flow.

The available studies show that cerebral SPECT is valid in discriminating individuals with Schizophrenia and healthy controls, having as gold standard a clinical diagnosis of a psychiatrist. In spite of this, the same studies reveal inconsistent changes in cerebral regional blood flow, particularly in frontal and temporal areas, in schizophrenic patients.

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