

**P06.06**

Changes in regional cerebral blood flow in response to acute vagus nerve stimulation in depressed patients and association with clinical response

C.R. Conway<sup>1</sup>, J.T. Chibnall<sup>1</sup>, J.W. Fletcher<sup>2</sup>, X. Li<sup>3</sup>, M.S. George<sup>3</sup>.  
<sup>1</sup>Saint Louis University, Department of Psychiatry; <sup>2</sup>Saint Louis University, Department of Nuclear Medicine; <sup>3</sup>Medical University of South Carolina, USA

**Background:** Stimulation of the vagus nerve (VNS) via implanted electronic device has anticonvulsant efficacy. In epilepsy studies VNS increased brain activation in some regions (medulla, thalamus, and postcentral gyrus) and decreased it in others (amygdala). Using positron emission tomography (PET), this study examined changes in regional cerebral blood flow (rCBF) with acute VNS in depressed patients and the relation to clinical response to VNS.

**Methods:** Using labeled 15O<sub>2</sub> water PET, four brains were scanned four times in succession, twice during a burst of VNS and twice at rest. Patients then received chronic VNS therapy for 6 months, with Hamilton Rating Scale for Depression (HAM-D) at baseline 3 and 6 months.

**Results:** Statistical parametric mapping will be done to measure acute rCBF differences in the medulla, thalamus, postcentral gyrus, and amygdala, as well as cingulate, prefrontal, and basal ganglia regions.

**Anticipated Conclusions:** Acute VNS in depressed subjects will cause a similar pattern of brain metabolism alteration as seen in epilepsy. Additional brain areas (anterior cingulate, prefrontal, and basal ganglia regions) will undergo metabolic change. Antidepressant response will be predicted by this activation.

**P06.07**

Trends in BOLD response during processing emotional cues in depression

S. Surguladze\*, M. Brammer, M. Phillips. *Institute of Psychiatry, King's College, London, UK*

**Objectives:** We investigated cortical response correlates to the processing of emotional facial expressions of varying intensity in major depression.

**Methods:** 9 patients in acute state of unipolar depression and 9 normal controls participated at event-related fMRI experiments. The subjects were asked to recognize the sex of individuals presenting different facial expressions, i.e., happy and sad. The intensity of facial expressions varied from neutral to 50% and 100%. We employed orthogonal polynomial trend analysis and compared the trends between the groups using voxel- and cluster-wise ANCOVA.

**Results:** Relative to controls, the patients demonstrated significantly stronger trends of activation in response to increasing intensity of sad expressions which were observed in visual cortical areas (BA19/37). Conversely, the patients had significantly weaker than normal trends to activate visual cortex (BA19/37) in response to processing of increasing intensity of happy expressions.

**Conclusions:** Greater than normal cortical modulation related to the processing of sad emotional expressions and weaker than normal modulation related to the happy expressions could represent a part of the mechanism of a mood-congruent bias in depression.

**P06.08**

Cerebral blood flow in bipolar disorder measured with PET: I trait effects at rest and after mood induction

S. Krüger<sup>1</sup>\*, K. Goldapple<sup>2</sup>, D. Kennedy<sup>3</sup>, H.S. Mayberg<sup>2</sup>.  
<sup>1</sup>Department of Psychiatry, University of Dresden, Germany  
<sup>2</sup>Rotman Research Center, University of Toronto, Canada  
<sup>3</sup>Center for Addiction and Mental Health, Clarke Site, Department of Psychiatry, University of Toronto, Canada

Objective Examination of resting state regional cerebral blood flow (rCBF) of remitted bipolar patients with Positron Emission Tomography (PET) is one approach for identifying functionally vulnerable brain regions that may be involved in mediating relapse. In addition, the known sensitivity of BD patients to external stressors may trigger new episodes. Imitating such stressors by exposing these patients to a sad stimulus may help to further identify aberrant functional responses. Method rCBF was measured in 9 remitted patients with BD and 8 healthy controls at rest and after induction of transient sadness using 15O-water PET. Results At baseline, BD patients, relative to controls showed bilateral decreases in dorsolateral prefrontal (DLPF, BA 9), inferior parietal (Par, BA 40) and left orbitofrontal cortex (OF, BA 11), increases in left inferior temporal cortex (BA 21), right anterior insula and left hippocampus. Common changes seen with induction of transient sadness in patients and controls included increases in premotor cortex, insula, and cerebellum and decreases in DLPF and Par. Exaggeration of baseline abnormalities in BD patients were characterized by further increases in anterior insula, and further decreases in medial frontal/DLPF, OF, Par and OF. Sadness-induced increases in regions with previously normal baseline function occurred in anterior cingulate (BA 24) and the striatum. Increased rCBF in subgenual cingulate uniquely distinguished sadness in controls from that in patients. Conclusions Although clinically well, basal brain activity in remitted bipolar patients deviates from the expected "normal" pattern, suggesting ongoing subclinical symptoms and risk for new episodes. Mood induction appears to further unmask areas of potential vulnerability. The stabilization of these regions with therapeutic measures may be an important step towards relapse prophylaxis in BD.

**P06.09**

Effects of VNS on regional cerebral blood flow in depressed subjects

M.D. Devous\*, M. Husain, T.S. Harris, A.J. Rush. *University of Texas Southwestern Medical Center, Nuclear Medicine Center, Dallas, USA*

**Objective:** Vagus nerve stimulation (VNS) has shown promising antidepressant effects in patients with treatment-resistant depression. This study employed SPECT imaging to determine if there were changes in regional cerebral blood flow (rCBF) after VNS in patients with treatment-resistant depression.

**Method:** Six subjects underwent SPECT imaging at baseline, post implant (before stimulation), and after 10 weeks of VNS. Image data were transformed into Talairach space and submitted to voxel-based analyses to investigate rCBF changes before and after VNS treatment. Comparisons to normal controls were also performed.

**Results:** When compared to normal controls, VNS patients at baseline had reduced rCBF to left dorsolateral prefrontal, antero-lateral temporal, and perisylvian temporal structures, including posterior insula. These patients, after 10 weeks of VNS, had increased rCBF in cingulate gyrus, bilateral thalamic activation, and

decreased rCBF in superior frontal gyrus, right mesial (posterior hippocampus) and lateral temporal regions. Classic rCBF abnormalities seen in depressed patients appear to resolve following 10 weeks of VNS.

**Conclusion:** These early data suggest that response to VNS therapy is associated with normalization of resting rCBF patterns.

### P06.10

Auditory event-related potential and PET: functional correlations

M. Emri<sup>1</sup>\*, T. Glaub<sup>2</sup>, R. Berecz<sup>2</sup>, Z. Lengyel<sup>1</sup>, P. Mikecz<sup>1</sup>, E. Bartok<sup>2</sup>, L. Tron<sup>1</sup>, I. Degrell<sup>2</sup>. <sup>1</sup>University of Debrecen, PET Center; <sup>2</sup>University of Debrecen, Department of Psychiatry, Hungary

**Introduction:** The identification of functional connections in the human brain during cognitive task may help to understand the organization of higher brain functions. The present study was aimed to detect neuronal circuits involved in a simple cognitive task of auditory "odd-ball" paradigm by using Auditory Event Related Potential (A-ERP) and PET parallelly.

**Method:** Nine healthy volunteers were studied. The subjects underwent 2 tasks, while the evoked potential was recorded. Task 1 was the resting condition with non-target pure tones, while Task 2 contained a rare (target) tone in 20% at a random sequence. Regional cerebral blood flow (rCBF) was measured by the intravenous injection of 50 mCi O15-butanol. Voxel-by-voxel analysis was performed to determine parallel changes in two different brain-regions ( $R < +/-0,65$ ).

**Results and Conclusions:** Strong positive correlations were found between the identical areas of the bilateral frontal medial gyri, temporal medial gyri and parahippocampal regions. Strong negative correlations were found between insular regions and ipsilateral/contralateral prefrontal areas, basal ganglions and cerebellum. We conclude that complex cortical and subcortical functional connectivity is present during the "odd-ball" cognitive task.

### P06.11

Auditory event-related potential and PET

T. Glaub<sup>1</sup>\*, R. Berecz<sup>1</sup>, M. Emri<sup>2</sup>, A. Fekeshazy<sup>2</sup>, T. Miklovitz<sup>2</sup>, E. Bartok<sup>1</sup>, I. Degrell<sup>1</sup>, L. Tron<sup>2</sup>. <sup>1</sup>University of Debrecen, Department of Psychiatry; <sup>2</sup>University of Debrecen, PET Center, Hungary

**Introduction:** During cognition there is a selection in the brain according to the meaning or importance of the stimuli. Auditory Event Related Potential (A-ERP) in "odd-ball" paradigm is a model of this situation. The aim of our study was to identify the neuronal substrate of this process by using A-ERP and PET parallelly.

**Method:** Nine healthy volunteers were studied. The subjects underwent 2 tasks, while the evoked potential was recorded. Task 1 was the resting condition with non-target pure tones, while Task 2 contained a rare (target) tone in 20% at a random sequence. rCBF was measured by intravenous injection of 50 mCi O15-butanol. The perfusion change was tested using multisubject analysis with subject interaction with two conditions and four replications by SPM99 software package.  $p < 0.001$  was considered as significant when identifying of brain structures involved in the performance of the task.

**Result and Conclusions:** Cerebral blood flow increase was observed in the anterior cingulate area during A-ERP. Our results support data in the literature that the anterior cingulate is a generator of this ERP activity.

## P07. Child and adolescent psychiatry

### P07.01

Borderline personality disorder by children and teen-agers use of tales in therapy workshops

H. Scharbach\*. *Departement CHU, Nantes, France*

Symptomatic expression of borderline states by children and teenagers is situated between two pathological poles in a continuum. Syndrome of empty behaviour, with blank objectal relation, depressive retirement, in link with a failure of libidinal investment and mode of narcissistic supplying. Bad being, loss of self confidence, bad self esteem is observable and for other thing.

Agressive reaction, even violent affects emergence before feeling of helplessness, even of detriment.

The helplessness denial, sustained by manic defense, reinforce the omnipotence, the all powerful influence with attempt to enter into relation with somebody without regulation. Affect's expression appear bumpy, rough.

Psychopathic behaviour is in relation with denial of dependence of vulnerability and of anaclitic position.

That's a lot of forms with affective instability, impulsivity behaviour, attentional failure, bad emotional regulation, lack of creativity.

In the therapeutic project, the narration of fairy tales, tales, stories and for oldier, of myths (Persee, Herakies, Promethee, Siegfried, etc.) legends is positive to develop the capacity of attention, the emotional and affective control and to bring symbolic income.

Tales's narration gives an excellent opportunity to each of the partners involved to get in touch and to assimilate the cognitive schemes and the references of the others. They also allow as therapeutic techniques an assessment of cognitive functioning.

They permit to treat meta-cognitive disturbances so often meet in this narcissistic personality pathologies.

It is to underlining the fact that tales, fables, myths and legends help to refresh unconscious motifs, thus is providing access to the springs of the subconscious to creation and maturing.

### P07.02

Role of the family during adolescence

N. Zdanowicz\*, P. Janne, Ch. Reynaert. *Université Catholique de Louvain, Service de Psychosomatique et Psychopathologie, Belgium*

**Objectives:** to examine the differences in family bonds between a "normal" population of young subjects aged 13 to 25 years, and a population suffering from mental disorders.

**Method:** 814 "normal" young subjects completed the Olson questionnaire about their own family. These people were compared with 358 young subjects suffering from mental disorders.

**Results:** the young subjects in the healthy group came from families that were markedly more cohesive and adaptable than those in the "pathological" group. It also transpired that the young "pathological" patients preferentially stemmed from the family categories "disengaged-structured" and "disengaged-rigid" as defined by Olson. While gender had no influence in these two groups, age determined a progressive reduction in cohesion in the normal young subjects.

**Conclusions:** While "normal" adolescence is marked by a decrease in family cohesion with age, adolescents suffering from mental disorders come from families which are less cohesive and