

14 healthy subjects on the one hand confirmed the physiologically assumed close coupling of EEG power and synchronization. On the other hand, our results indicate that specific RSNs are associated with specific frequencies smaller than the regular EEG frequency bands. Furthermore, the topographic distribution of scalp fields matters and finally the RSNs show overlapping regions with BOLD correlates of specific EEG features in regions very consistent across subjects whereas regions less consistent show no concordance.

References

1. De Luca M, Beckmann CF, De Stefano N, Matthews PM, Smith SM: fMRI resting state networks define distinct modes of long-distance interactions in the human brain. *NeuroImage* 2006;29:1359–1367.
2. Mantini D, Perrucci MG, Del Gratta C, Romani GL, Corbetta M: Electrophysiological signatures of resting state networks in the human brain. *Proc Natl Acad Sci U S A* 2007;104:13170–13175.
3. Laufs H, Krakow K, Sterzer P, Eger E, Beyerle A, Salek-Haddadi A, Kleinschmidt A: Electroencephalographic signatures of attentional and cognitive default modes in spontaneous brain activity fluctuations at rest. *Proc Natl Acad Sci U S A* 2003;100:11053–11058.
4. Koenig T, Lehmann D, Saito N, Kuginuki T, Kinoshita T, Koukkou M: Decreased functional connectivity of EEG theta-frequency activity in first-episode, neuroleptic-naive patients with schizophrenia: preliminary results. *Schizophr Res* 2001;50:55–60.
5. Koenig T, Marti-Lopez F, Valdes-Sosa P: Topographic time-frequency decomposition of the EEG. *NeuroImage* 2001;14:383–390.

This study was financed by the Swiss National Science Foundation grant 320000-108321/1.

6

Anger Regulation: Childhood Abuse Interacts with COMT But Not with 5-HT Genotypes in Suicide Attempters

N. Perroud¹, I. Jaussent², F. Bellivier³, A. Malafosse⁴, P. Courtet⁵

¹Department of Psychiatry, University of Geneva, Switzerland; ²INSERM U888, Montpellier, ³Department of Psychiatry, AHP, Henri Mondor-Albert Chenevier Hospitals, Creteil, France; ⁴Department of Medical Genetics and Laboratories, University Hospital of Geneva, Switzerland; ⁵Department of Psychological Medicine and Psychiatry, Lapeyronie Hospital, CHU Montpellier, France

Aims: Anger related traits are potentially regulated by genes as well as early environmental factors. Childhood maltreatment and genetic factors are well known vulnerability factors for suicidal behaviors, and they may influence the constitution of intermediate phenotypes such as anger traits. In this study we tested the interaction between susceptibility genes for suicidal behaviors and childhood trauma on anger related traits in a population of suicide attempters who are presumed to carry or express these risk factors. **Methods:** 875 suicide attempters assessed with the State-Trait Anger Expression Inventory (STAXI) were genotyped for fourteen polymorphisms in nine candidate genes previously associated with anger related traits and/or suicidal behaviors. The Childhood Trauma Questionnaire (CTQ) was used to examine the

traumatic childhood experiences. A logistic regression was used to investigate the interaction between the candidate genes and childhood maltreatment on the STAXI subscales. **Results:** The functional polymorphism of the catecholamine-O-methyl-transferase (COMT) gene Val158Met significantly modulated the association between sexual abuse and anger trait level as measured by the Trait Anger subscale ($p = 0.001$). In the presence of a sexual abuse, individuals carrying the Val high activity allele displayed higher disposition toward anger than individuals homozygous for the Met allele ($p = 0.0003$). **Conclusions:** The results of the present study suggest that interaction between childhood abuse and COMT modulates anger trait level. Interestingly, none of the 5-HT related genes tested interacted with childhood abuse to influence anger traits. This study was carried out in an enriched population of patients for the frequency of abuse and known to express high level of anger. These results warrant to be replicated in other populations, including healthy subjects. These findings support the hypothesis that the functional polymorphism in the COMT gene, but not 5-HT related genes, by interacting with childhood abuse, may influence the phenotype associated with anger.

7

Experience in Long-term Meditation Reduces the Hypothalamic-Pituitary-Adrenocortical (HPA) Axis Activity

S. Brand¹, S. Schmidt², J.R. Naranjo², E. Holsboer-Trachsler¹

¹Psychiatric University Clinics Basel, Depression Research Unit, Basel, Switzerland; ²Institute for Environmental Health Sciences, University Medical Center Freiburg, Germany

Research Questions: There is an increasing effort in research to uncover the underlying changes in biological processes that are associated with reported changes in mental and physical health in response to meditation. Moreover, there is evidence that meditation decreases anxiety and increases positive affect. However, the impact of short- and long-term meditation on the HPA axis activity has been poorly investigated so far. To investigate the HPA axis activity is particularly important because aberrant cortisol secretion is associated with depressive disorders. The aim of the pilot study was to associate the HPA axis activity-dependent cortisol secretion with the duration of meditation in people with long-term expertise, and to compare patterns of cortisol secretion before and after training of novices in meditation. **Methods:** Eighteen people took part in the study. Nine of them (age (years): $M = 49.8$, $SD = 7.50$) had long-term expertise in meditation (duration (months): $M = 264$; $SD = 95.5$), and nine were novices (age: $M = 40.2$, $SD = 11.44$). Saliva samples to analyze cortisol secretion were gathered before and after the first and the last training session of an 8 week behavioral intervention termed Mindfulness Based Stress Reduction (MBSR) which includes daily meditation practice. **Results:** In people with long-term expertise, duration of meditation highly correlated with decreased cortisol secretion before ($r = -0.69$, $p = 0.04$; controlling for age: $r = -0.72$, $p = 0.045$) and after training ($r = -0.74$, $p =$

0.02; controlling for age: $r = -0.68$, $p = 0.06$). In novices, no statistically significant differences in mean cortisol secretions before and after the intervention could be observed, although there was a general decrease. **Conclusions:** Results suggest that long-term experience in meditation has a favorable impact on the HPA axis activity. This result may in part explain why MBSR has a favorable impact on depressive symptoms.

8

Children Suffering from Separation Anxiety Disorders (SAD) Show Increased HPA Axis Activity Compared to Healthy Controls

S. Brand¹, S. Schneider², F. Wilhelm², E. Holsboer-Trachsler¹

¹Psychiatric University Clinics Basel, Depression Research Unit, Basel, ²Clinical Child and Adolescent Psychology, University of Basel, Switzerland

Research Questions: The peak onset for many psychiatric disorders is adolescence, a time of remarkable physical and behavioural changes, but evidence for the beginning of psychiatric disorders already in childhood is given for ADHD, phobias, anxiety, and separation anxiety. With regard to separation anxiety disorders (SAD), little is known about the interplay between SAD and the neuroendocrine functioning. Therefore, the present study aimed at investigating the association between SAD and HPA axis activity in children suffering from separation anxiety compared to healthy controls. **Methods:** A total of 31 children with diagnosed SAD (mean age: 8.45; 17 females, 14 males) and 25 healthy controls (HC; mean age: 9.74; 12 females, 13 males) took part in the study. All participants underwent several psychological and physiological tests lasting about two hours in the afternoon. Six saliva samples to assess HPA axis related cortisol secretion were gathered in parallel. **Results:** Compared to healthy controls, children with SAD showed a highly increased HPA axis activity, as reflected by an increased cortisol secretion (always in nmol/l): AUC basal: SA: 1117.55, HC: 262.74; $w(30.58) = 2.87$, $p = 0.007$; AUC total: SA: 1390.85, HC: 180.14; $w(30.10) = 2.93$, $p = 0.006$; AUC netto: SA: 273.30, HC: -82.59; $w(30.51) = 1.96$, $p = 0.06$. **Conclusions:** Separation anxiety disorders in children are reflected by highly increased HPA axis activity. Most importantly, compared to healthy controls, children with SAD showed increased basal cortisol values already at the beginning of and throughout the entire investigation. We hold that children suffering from SAD seem to be continuously under psychophysiological tension, which may lead to strain for social and academic performance.

9

Burnout-related Emotional and Physical Exhaustion, But Not Depressive Symptoms, Is Related to Sleep Complaints in a Non-clinical Sample

S. Brand¹, W. Ruch², M. Hatzinger³, A. Harbaugh⁴, E. Holsboer-Trachsler¹

¹Psychiatric University Clinics Basel, Depression Research Unit, Basel, ²Department of Psychology, Personality and Diagnostics, University of Zurich, ³Department of Psychiatric Outpatient, University Hospital, Basel, ⁴Swissburnout, Bern, Switzerland

Research Questions: Burnout is considered a work-related emotional and physical exhaustion, and previous studies showed that independently of gender and age, high burnout scores were related to increased sleep complaints. By contrast, people with optimistic attitude seem to be less vulnerable to stress and burnout. Therefore, assessing a non-clinical sample, the present study aimed at investigating the relation between burnout, depressive symptoms, satisfaction with life, and sleep complaints in parallel. **Methods:** A total of 2231 participants (age [years]: $M = 40.77$; $SD = 10.30$; 1183 females and 1048 males) took part in an internet-based study. Participants completed a series of questionnaires such as the Tedium Measure (TM; Pines, Aronson, & Kafry, 1983), the Insomnia Severity Index (ISI; Bastien et al., 2001) and the Satisfaction with Life-questionnaire (SWL; Diener et al., 1985). For statistical analyses, first, factor analyses split the TM in the dimension Depressive symptoms, Emotional and physical exhaustion, and Pessimism. Afterwards, to analyse all questionnaires in parallel, a Structural Equation Model (SEM) was applied. **Results:** Pessimism, emotional and physical exhaustion, depressive symptoms, and low satisfaction with life were highly inter-related. Emotional and physical exhaustion was highly related to sleep complaints, whereas sleep complaints were not related to depressive symptoms, satisfaction with life, and pessimism. **Conclusions:** Results suggest that among burnout symptoms the emotional and physical exhaustion is strongly related to sleep complaints and not depressive symptoms in this non-clinical sample. This is in line with the hypothesis that sleep disturbances may play a role in the development from non-clinical burnout to depression, by increasing emotional and physical exhaustion.