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### P.372 Neural substrates of metaphor comprehension impairments in chronic schizophrenia outpatients - an fMRI study

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**Aim:** Difficulties with understanding figurative meaning of language (such as metaphors, irony and humor) represent one of the key features of schizophrenia, with patients accepting literal meaning over the figurative one [1]. Previous studies on neural correlates of metaphor comprehension suggested abnormal engagement in left inferior/medial frontal gyrus [2,3], temporal lobe [2], and inferior parietal lobule [3]. These studies were focused on metaphor comprehension as a whole, however, it is not yet established on which stage of metaphor processing the deficit arises. Our aim is to evaluate metaphor comprehension according to its stage of processing and respective neural correlates of its impairments in outpatients with schizophrenia.

**Method:** Thirty outpatients diagnosed with schizophrenia and 30 sex, age and education matched healthy controls were recruited for the study. We assessed metaphor processing by fMRI punchline-based metaphor comprehension task, which consisted of 90 stories, whereas 30 of them had metaphorical, 30 absurd (nonsensical) and 30 neutral (literal) endings. The stories were presented in randomised order in 3 runs. After reading the story, participants decided whether the ending fit the story and whether it was metaphorical. We analyzed three between group contrasts: absurd vs neutral stories (incongruity detection), metaphor vs absurd (incongruity resolution and elaboration) and metaphor vs neutral (complete metaphor processing). Neuroimaging data were acquired with Siemens Skyra 3T scanner with 64 - channel coil and analyzed using FSL (v6.0). Results were thresholded at uncorrected voxel level  $p <$

0.001 and cluster  $n > 10$ . Behavioral data were analyzed using JASP (Version 0.9).

**Results:** During incongruity detection, the clinical group revealed decreased activation in the left lateral orbitofrontal and middle occipital/cuneus cortices as well as increased activation in the left lingual, postcentral and superior temporal gyri, inferior parietal lobule, supramarginal gyrus and sensorimotor cortex, and in the right postcentral gyrus, rolandic operculum, middle cingulate and putamen. During complete metaphor comprehension schizophrenia outpatients revealed decreased activation in the left dorso-lateral prefrontal cortex compared to healthy controls. No between group differences in activation were found during incongruity resolution and elaboration contrast. On behavioral level, the clinical group had longer reaction times on all levels of metaphor processing and their ratings were less accurate in terms of comprehensibility and metaphoricality than healthy controls.

**Conclusion:** Our results indicate the abnormal incongruity detection processing (absurd vs neutral) in schizophrenia outpatients, manifested by left hemisphere alterations accompanied by hyperactivation of the left temporo-parietal, right middle cingulate and bilateral frontal cortices compared to healthy controls. This might suggest existence of some form of compensation mechanisms during the early phase of metaphor processing in individuals with schizophrenia, which may be considered the neural basis of deficit. Finally, the essential difference revealed by the complete metaphor processing contrast (metaphorical vs neutral) - the lesser engagement of the left dorsolateral prefrontal cortex - might be considered further in terms of the neurocognitive deficit and neuropsychopathology of schizophrenia in general.

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### P.374 Cortisol and DHEAS related to metabolic side effects in patients with schizophrenia

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**Background:** Metabolic syndrome is a cluster of symptoms, characterized by central obesity, type 2 diabetes mellitus, dyslipidemia, and hypertension, with a higher prevalence in patients with schizophrenia compared to the general population. This contributes to having a significantly higher mortality rate and shortened life expectancy of individuals suffering from schizophrenia. Therefore, an ongoing need exists for reliable predictors of metabolic risks in individual patients indicated for antipsychotic treatment.

Hypercortisolism is associated with central obesity on the one hand and adaptation to significant stress to the other [1,2]. Dehydroepiandrosterone is a second steroid hormone which has been associated with metabolic syndrome. Blood DHEA sulfate (DHEAS) levels are partly independent of hypercortisolism as these hormones are produced in different layers of the adrenals [3]. The cortisol/DHEAS ratio has been found to predict health outcomes better than the level of either hormone alone as well as all-cause mortality [4]. The association between cortisol/DHEAS ratio and another subcomponent of metabolic syndrome (diastolic blood pressure) in patients suffering from bipolar disorder and schizophrenia was found [5].

This study aims to determine the association between levels of cortisol, DHEAS, their ratio and the presence of MetS in patients with schizophrenia.

**Methods:** The study was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. After obtaining approval of the study protocol by the local ethical committee, suitable participants were recruited from psychiatric hospitals. All subjects gave informed consent after proper explanation of the study. We included 110 patients with the diagnosis of paranoid schizophrenia verified according to the International Statistical Classification of Diseases, 10th Revision (ICD-10: F20). Patients have been divided into two groups with and without MetS according to criteria the International Diabetes Federation IDF (2005). All patients received antipsychotic treatment. The control group included 42 mentally and physically healthy subjects. Serum cortisol and DHEAS were measured using immuno-enzyme analysis. Statistical analysis was performed by SPSS version 20.0.

**Results:** Forty-two patients met IDF-criteria for MetS. There were no group differences in gender and clinical (leading symptoms, duration of illness) parameters except for age (patients with MetS were statistically older). We found a significant increase in the concentration of cortisol in the serum of schizophrenic patients with a MetS ( $p=0.021$ ) and a decrease in the concentration of DHEAS in the serum of patients with schizophrenia without a MetS ( $p=0.046$ ) compared with the control group. No significant differences the hormone levels between patients with and without MetS were established. The cortisol/DHEAS ratio tended to be increased in patients with MetS in comparison to patients without MetS ( $p=0.06$ ).

**Conclusions:** Literature data and our results suggest that disturbances within the hypothalamo-pituitary-adrenal axis can reflect the metabolic disbalance and could be a novel biomarker to predict metabolic side effects associated with

antipsychotic treatment. Given the high prevalence of MetS in schizophrenia patients and the role of cortisol/DHEAS ratio in health outcomes, it would be worthwhile to examine this relation in larger psychiatric samples further.

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## P.375 Self-awareness of disability and insight in patients with schizophrenia

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**Background:** Schizophrenia is a significantly disabling disease that affects all major areas of life. Psychosocial disabilities in schizophrenia were included psychopathological symptoms, basic cognition, social cognition, social functioning, and quality of life. Most of the previous studies of awareness in schizophrenia were focused on insight into the presence of psychotic symptoms. It is important to gather information about insight into disability in schizophrenia because patients with schizophrenia who are aware of their disability are more likely to be motivated to receive treatment including rehabilitation programs. The American Psychiatric Association recommends the World Health Organization Disability Assessment Schedule (WHODAS) as a more objective, disease non-specific assessment of patient functioning. The WHODAS also presumes a certain level of insight into one's illness. The purpose of this study was to evaluate the association between the self-awareness of disability using WHODAS and insight, cognitive function, and psychosocial factors in patients with schizophrenia.