Abnormal activation of semantic networks as intermediate phenotype for psychotic disorder

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Background: Abnormal increase in activation of semantic networks in patients with psychotic disorder possibly causes some of the symptoms of the disorder, e.g. loose and unusual associations. This semantic network dysfunction can be studied using the N400 event-related potential (ERP), a language-specific component. The purpose of this study was to determine whether patients with a psychotic disorder and healthy siblings show abnormalities in the N400 component.

Method: Twenty-two patients with psychotic disorder, 20 unaffected first-degree relatives and 20 controls participated in a lexical decision task and ERPs were recorded to target words that were associatively, indirectly, and un-related to their preceding prime word.

Results: Patients showed an increased associative priming effect, with faster N400 latencies for the associative condition compared to the un-related condition, which was not seen in controls. This effect was also found in siblings on different electrodes. Compared to patients and siblings, only controls showed a delayed N400 for the indirect condition compared to the unrelated condition at central electrodes, whereas patients showed an indirect priming effect at lateral electrodes. Furthermore, patients and siblings showed an increased delayed N400 at the left hemisphere for the direct and the indirect condition.

Conclusion: At the neural level, abnormal spreading of activation in the semantic network is present in patients with psychotic disorder, and also siblings showed a dysfunction of the semantic network system. Further, late differences were shown to be affected in patients and siblings suggesting that the N400 component may serve as possible risk marker for psychosis.

From Mean To Meaning: Neurobiological and Neurocognitive Contributions to Diagnosis and prediction in psychosis and at-risk states

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Neurobiological and neurocognitive research on psychosis and at-risk mental states (AR) has produced a large body of important findings, improving our knowledge about the brain-related changes associated with these mental states. However, significant findings are mostly based on differences of distributions and allow only conclusions about groups. Moreover, most findings show a considerable overlap of single data between experimental and control groups. Although most valuable for basic research, these observations’ lack of diagnostic or predictive accuracy (or at least of analyses trying to test this aspect) precludes their transfer into clinical practice.

Our symposium intends to present studies and results promising to overcome this situation. Anita Riecher-Rössler will present a model considering neuropsychological and psychopathological variables and showing a very good predictive accuracy, thereby including a negative language. Based on neuropsychological findings, she will demonstrate the capability of pattern analysis for clinical practice. Mitja Bodatsch will introduce a model including neurophysiological and psychopathological data, which does not only predict later conversions to psychosis very well, but also allows to further stratify the risk, contributing to the desired individualization of risk estimation. Michio Suzuki will demonstrate a structural MRI (sMRI) based model allowing to differentiate between patients with first episode psychosis, bipolar disorder and healthy controls (HIC). Eva Meisenzahl will present a sMRI based method able to discriminate HC from AR patients and to predict transition to psychosis. The symposium will thus give an excellent overview on current opportunities to improve diagnosis and prediction by neurobiological and neurocognition.