

Associations between aerobic fitness and brain structure in schizophrenia with a focus on hippocampal formation subfield volume [Abstract]

I. Maurus, L. Roell, D. Keeser, B. Papazov, Irina Papazova, M. Lembeck, Astrid Röh, Elias Wagner, D. Hirjak, B. Malchow, B. Ertl-Wagner, S. Stoecklein, Alkomiet Hasan, A. Schmitt, A. Meyer-Lindenberg, P. Falkai

Angaben zur Veröffentlichung / Publication details:

Maurus, I., L. Roell, D. Keeser, B. Papazov, Irina Papazova, M. Lembeck, Astrid Röh, et al. 2022. "Associations between aerobic fitness and brain structure in schizophrenia with a focus on hippocampal formation subfield volume [Abstract]." *Neuroscience Applied* 1 (Supplement 2): 100865. <https://doi.org/10.1016/j.nsa.2022.100865>.

intervention, highlighting several promising pharmacological approaches including levetiracetam, sodium valproate, N-acetylcysteine, and cannabidiol. Finally, we conclude with future research directions, underscoring the importance of multidimensional approaches with which neuroimaging techniques may both aid in the identification of those at highest risk of psychosis, as well as help characterise new targets for pharmacological interventions.

Conflict of interest

Disclosure statement:

AAG has received consulting fees from Alkermes, Lundbeck, Takeda, Roche, Lyra, Concert, and SynAgile. RM has received honoraria from Janssen and Otsuka. The other authors declare no conflicts of interest.

doi: <https://doi.org/10.1016/j.nsa.2022.100864>

P.0846

NEUROSCIENCE APPLIED 1 (2022) 100112 100865

Associations between aerobic fitness and brain structure in schizophrenia with a focus on hippocampal formation subfield volume

I. Maurus¹, L. Roell¹, D. Keeser¹, B. Papazov², I. Papazova³, M. Lembeck¹, A. Roeh³, E. Wagner¹, D. Hirjak⁴, B. Malchow⁵, B. Ertl-Wagner⁶, S. Stoecklein², A. Hasan³, A. Schmitt¹, A. Meyer-Lindenberg⁴, P. Falkai¹.
1University Hospital LMU Munich, Department for Psychiatry and Psychotherapy, Munich, Germany; 2University Hospital LMU Munich, Department for Radiology, Munich, Germany; 3University of Augsburg-Bezirkskrankenhaus Augsburg, Department of Psychiatry- Psychotherapy and Psychosomatics of the University Augsburg, Augsburg, Germany; 4Medical Faculty Mannheim- Heidelberg University, Central Institute of Mental Health, Mannheim, Germany; 5University Hospital Goettingen, Department of Psychiatry and Psychotherapy, Goettingen, Germany; 6The Hospital for Sick Children, Division of Neuroradiology- Department of Diagnostic Imaging, Toronto, Canada

Introduction: Persisting symptoms such as cognitive deficits are common in individuals with schizophrenia and have been associated with alterations in cerebral gray and white matter volumes. In this regard, hippocampal formation volume loss is a robust finding with select subfields such as the cornu ammonis, dentate gyrus and subiculum being particularly vulnerable. Negative correlations between these subfield volumes and cognitive functioning in individuals with schizophrenia have been demonstrated, whereby verbal memory is one of the domains the most affected.

For some time now, aerobic endurance training is considered as a promising intervention to alleviate schizophrenia symptoms and cognitive deficits and an improvement in aerobic fitness is assumed to be a key moderator variable. In clinical trials, exercise improving aerobic fitness has also been suggested to have the potential to counteract hippocampal volume decline in individuals with schizophrenia but findings remain inconclusive to date.

In the present study, we first explored whether aerobic fitness is associated with global and regional grey and white matter volume in individuals with schizophrenia. Second, we investigated the associations between aerobic fitness levels and the hippocampal formation volume on its subfield level and third, whether potential associations mediate verbal memory functioning.

Methods: In this cross-sectional study, 69 individuals with schizophrenia at two centres underwent assessments of aerobic fitness (using lactate threshold tests) and cranial structural magnetic resonance imaging. In 53 participants, a scanning resolution of less than 1 mm³ was available which is recommended for hippocampal formation subfield measurements. In addition, verbal memory was assessed with the verbal learning memory test.

Multilevel Bayesian and frequentist partial correlations were performed to quantify the associations between fitness levels and global and regional grey and white matter volumes. To determine whether aerobic fitness was associated with hippocampal formation subfield volumes multivariate multiple linear regressions were computed. Age, sex, body mass index, disorder duration, education years, and chlorpromazine equivalents were defined as covariates.

Study Results: Our main finding in our first explorative analysis was a positive association of aerobic fitness with global right hippocampal grey matter volume and white matter volumes in parahippocampal and several cerebellar regions. In our analysis of hippocampal formation subfield volumes, significant positive associations between aerobic fitness levels and most subfields could be shown with the strongest associations seen in the cornu ammonis areas, the dentate gyrus, and the subiculum. We found no significant mediation effects of the associations identified on verbal memory.

Conclusions: In summary, despite the need for cautionary interpretation of our cross-sectional findings, our results support the notion that aerobic fitness and in particular hippocampal plasticity are interrelated. Aerobic fitness may mitigate hippocampal formation volume loss especially in the subfields the most vulnerable in schizophrenia. Our findings as well as their impact on cognitive symptoms should be further addressed in longitudinal studies.

Conflict of interest

Disclosure statement:

The work was supported by the German Federal Ministry of Education and Research (BMBF) through the research network on psychiatric diseases ESPRIT (Enhancing Schizophrenia Prevention and Recovery through Innovative Treatments coordinator, Andreas Meyer-Lindenberg grant number, 01EE1407E) to AML, PF, AH, and AS. Furthermore, the study was supported by the Else Kröner-Fresenius Foundation to PF, AS, and IM (Residency/PhD track of the International Max Planck Research School for Translational Psychiatry [IMPRS-TP]). The "Studienstiftung des deutschen Volkes" provided a PhD scholarship to Lukas Röhl.

doi: <https://doi.org/10.1016/j.nsa.2022.100865>

P.0847

NEUROSCIENCE APPLIED 1 (2022) 100112 100866

Cycloid psychosis – in between humor and psychosis

M. Bicho¹, J.M. Coelho¹, H. Fontes¹, C. Peixoto¹, B. Peixoto¹, M. Cruz¹, P. Baiao¹, I.A. Ferreira¹. 1Hospital do Divino Espírito Santo de Ponta Delgada- EPER, Psychiatry, Ponta Delgada- São Miguel- Açores, Portugal

Introduction: Cycloid psychosis, a term proposed by Karl Kleist (1879–1960), is a condition characterized by recurrent nonaffective episodes in ordinarily well-functioning persons, that have a rapid onset and a rapid acute response to treatment, sometimes without hospitalization. Based on case descriptions, Karl Leonhard proposed three major types of such psychoses: anxious-elation, confusional excited-inhibited, and hyperkinetic-akinetic motility disorders. In fact, literature says that this condition can affect patients' cognition, mood and motor skills. All forms can involve a phasic, cyclic course with full recovery between episodes, although mild residual might be found between episodes. Given its relative complexity, Leonhard's three-subtype classification is unlikely to be widely favored for clinical application.

Interepisode recovery is nearly complete and prognosis tends to be better than for either bipolar or schizophrenic disorders.

It is not a widely recognized diagnosis and etiology and morphological characterization remain unclear.

Aims: The authors intend to review the relevant and current literature in order to extend the knowledge about this condition and find the best conducts for clinical practice.

Methods: Non-systematic literature review.

Results: Cycloid psychosis refers to a nosological entity characterized by the occurrence of psychotic episodes of sudden onset, with polymorphic characteristics, of limited duration and with complete recovery, although residual symptoms could be found in some cases. It is a condition that is not always easy to diagnose, especially in inaugural episodes. It is therefore important to carry out a differential diagnosis with other pathologies, namely schizophrenia, schizoaffective disorder, manic episode and organic disorder.

Interestingly, it does not appear to be familial and the etiology and morphological characterization remain unclear.

Regarding treatment and in an acute phase, the combination of benzodiazepines and second-generation antipsychotics, probably due to their effect on mood stabilization, is a valid option. However, first-generation antipsychotics such as haloperidol can also be used. Electroconvulsive therapy is mainly used in situations with marked motor impairment. Lithium is traditionally considered the best maintenance treatment.

To date, there are no randomized studies among the different interventions that allow us to assess the best approach.

Conclusion: Cycloid psychoses are still poorly understood, and doubts persist as to whether they are an independent nosological entity, an atypical variant of affective disorders or a psychosis within the spectrum of schizophrenia. Several investigators have supported the nosological validity of cycloid psychosis. Some patients considered to represent cycloid psychosis do have relatively prominent affective features, however, as well as a family history of mood disorders.

This condition has a generally good outcome with interepisode recovery and response to medications, particularly antipsychotics and patients are frequently