
EFFECTS OF EXERCISE THERAPY ON WHITE MATTER INTEGRITY IN PATIENTS WITH SCHIZOPHRENIA AND HEALTHY CONTROLS- A LONGITUDINAL DTI STUDY

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Introduction

In the recent years, interest of researchers has been focused on exercise as a possible way to efficiently influence brain functions and plasticity. Several studies concluded that exercise can change brain morphology by affecting synapses, neurogenesis and angiogenesis and improve efficiency in working memory and executive performance. In schizophrenia, white matter integrity is compromised and to what extent exercise affects white matter integrity is unclear.

Aims

To investigate the effect of 6 months exercise therapy on white matter integrity in healthy controls and patients with schizophrenia.

Methods

A total of 33 patients with schizophrenia and 48 healthy controls, matched for demographic characteristics, were randomized into exercise or occupational therapy/life-as-usual. 3T-DTI data were acquired twice. After susceptibility-artifacts and ECC correction, TBSS was used for registration to standard space and computation of the FA-skeleton. The JHU-ICBM-tract atlas was used to define regions of interest (ROI) for the various fiber tracts. Mean FA values for the FA-skeleton within the separate tract ROIs were calculated. GLM-repeated measures design was done with time as within-subject factor, group and therapy as between-factors, and compliance as covariate.

Results

Significant increases in FA were found for time by randomization in the left corticospinal tract (LCST) ($F=4,15$, $p=0,045$), left superior longitudinal fascicle (LSLF)($F=5,092$, $p=0,027$) and forceps major ($F=5,687$, $p=0,02$).

Conclusions

Exercise positively affects FA of tracts involved in primary motor functions (LCST), regulation of motor behavior, spatial attention, oculomotor functions and transfer of somatosensory information (LSLF) as well as interhemispheric connections (Forceps major) in both groups.