Difference in rich-club sites in patients with schizophrenia and the healthy control group

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To restore and determine the localization of rich-club areas, patients with a diagnosis of schizophrenia and conditionally healthy volunteers underwent diffusion MRI. According to diffusion MRI, structural connectomas were restored, after which the connectivity matrices of the brain regions with each other were calculated based on AAL atlas.

Materials and methods

Scanning was performed on a Siemens Magnetom Verio 3T MTR. For data acquisition was used 32-channel coil for the brain. Diffusion scanning involved 29 patients (17 m., 12 fem., 24-39 y.o.) with a diagnosis of schizophrenia and 144 conditionally healthy volunteers (89 m., 65 fem., 20-34 y.o.).

. Mental Health Assessment: PANSS, NSA-4, BFCRS, Frontal Asstssment Battery (FAB)

All participants signed the Voluntary Informed Consent List. Processing the scan results in two stages: preprocessing, construction of connectivity matrices of brain regions and analysis of connectivity matrices using graph theory to identify areas that fall under the criterion of a "rich club". Data processing in the dcm2nii program from MRICron, topup module in the FSL and using the DSI-studio.

Results:

The results show a 40% difference in rich-club sites in patients with schizophrenia and the control group, taking into account the distortion correction characteristic of echo-planar MR-sequences.

Conclusions: the obtained data showed a sharp decrease in the "rich-club" correlated with the degree of negative, psychomotor and cognitive impairments in patients with schizophrenia compared with healthy ones.

	SCH	Control
PANSS (N1-N7)	28,2	8,8
NSA-4	20,6	5,1
BFCRS	8,2	0,0
FAB	13,4	18,0

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