



Dance Training Improves the Functional Connectivity within cortico-basal ganglia loops and Salience Network in Schizophrenia

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1. Background

Dance training in healthy participants proved to enhance the connection within cortico-basal ganglia loops and salience network which could be the core circuits related to schizophrenia syndromes. However, whether this improvement would be valid in Schizophrenia is unknown.

2. Method

This study recruited 40 schizophrenias randomly divided into dance or aerobic training groups for 3 months. Rest-fMRI scan, Positive and Negative Symptom Scale (PANSS), MATRICS Consensus Cognitive Battery (MCCB) and Voxel-Mirrored Homotopic Connectivity (VMHC) were performed.

3. Result

● Syptom and cognitive change:

The PANSS total scores ($P < 0.05^*$) and negative symptom scores ($p < 0.001^{**}$) were significantly decreased in the dance group. The post hoc results of MCCB indicated a significant increase in Hopkins Verbal Learning Test scores ($P < 0.05^*$) in the dance group.

● Voxel-Mirrored Homotopic Connectivity:

Dance training prevented the decrease of VMHC within salience network and cortico-basal ganglia loops, including ACC, MFG, precentral gray and putamen

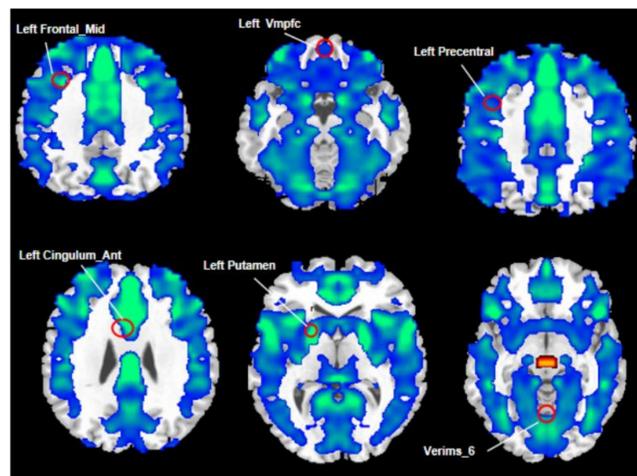


Fig.1 Significant grey matter VMHC reductions within cortico-basal ganglia loops and Salience Network within schizophrenia compared with healthy controls at baseline.

The normalized VMHC was observed in the limbic system, e.g. orbital frontal cortex in the dance training group. These positive training effects were not observed in the aerobic training group.

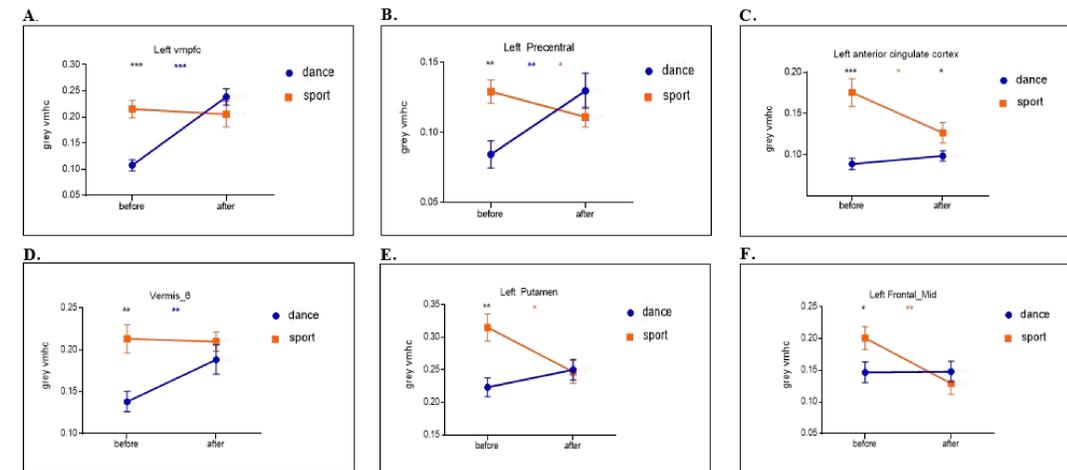


Fig.2 Compared with aerobic training, dance training prevented the decrease of VMHC within salience network and cortico-base ganglia loops, including ACC, MFG, precentral gray and putamen.

● The correlation between syptom and functional Connectivity:

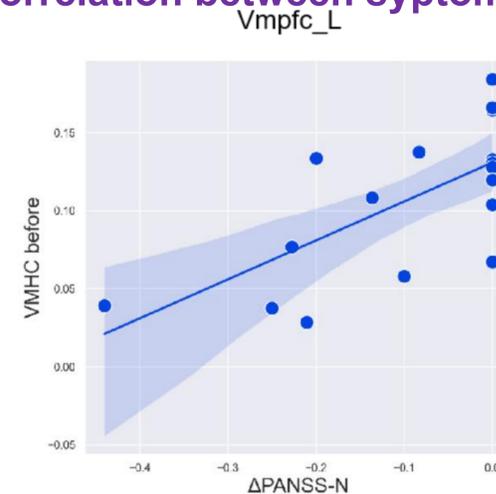


Fig.3 There is a significantly correlation of dance group between negative panss score and vmhc baseline value in left ventral medial prefrontal lobe. ($r=0.68164$ $p=0.0018371^{**}$)

4. Conclusion

The results suggested dance training could improve the function connection within the two core circuits, which might contribute to remit the clinical symptoms and cognitive deterioration in schizophrenia.