DISC1 and G72 Genetic Interaction and Visual Learning in Patients with Schizophrenia

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Abstract

Background

Visual memory plays an important role in daily life of general population and in patients with schizophrenia. Two functional single nucleotide polymorphisms (SNPs), Ser704Cys of the *DISC1* gene and M24 of the *G72* gene, are strongly associated with pathogenesis of schizophrenia. This is the first genetic study on visual memory in humans. It examined the interactions of the two SNPs and visual learning (delayed visual memory) in patients with schizophrenia.

Methods

Two hundred seventy-one patients with chronic schizophrenia, stabilized with antipsychotic treatment for > 3 months, were assessed for verbal (word list) and visual memory (visual memory reproduction/visual learning) of Weschler Memory Scale-III (WMS-III), Continuous Performance Test, and genotyped for the *DISC1* Ser704Cys SNP and *G72* M24 SNP.

Results

Cys/Cys-*DISC1* homozygotes had poorer delayed visual memory than the Ser-*DISC1* allele carriers (Ser/Ser and Cys/Ser) (p=0.004, effect size: 0.43), meanwhile no difference was found between patients with *G72* M24 A-allele and T/T-*G72* M24 genotype (p= 0.590, effect size: 0.07). Patients carrying Ser-*DISC1* allele with T/T- *G72* M24 genotype had better delayed visual memory than patients carrying Cys/Cys-*DISC1* genotype with T/T- *G72* M24 genotype (p= 0.004, effect size: 0.70) and with *G72* M24 A-allele (p= 0.003, effect size: 0.65). Education had positive effect (p= 0.007) while negative symptoms had negative effect (p=<0.001) on delayed visual memory.

Conclusion

This is the first study associating genetic variation (here, in *DISC1* Ser704Cys and *G72* M24) with visual memory deficit.