Interaction analysis of apolipoprotein D and dopamine D2 receptor gene variants in schizophrenia

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Background

Schizophrenia is a complex multifactorial mental disorder, in which the dysfunctions of different biological networks are surmised.
D2 receptor is an essential site of action regarding all antipsychotics.
D2 also has a role in phospholipid network.
The impairment of phospholipid network is observed in patients as revealed by reduced skin flush response to niacin.
Decreased membrane- and increased citosolic arachidonic acid levels were reported in schizophrenia.
Antipsychotic medication and symptom improvement results in a significant increase in red blood cell membrane arachidonic acid density.

• In this preliminary case-control study the interactions of dopamine D2 receptor gene and genetic variants of the phospholipid network were examined to map possible connections.

Conclusion

This study showed interaction between Apolipoprotein D and D2 receptor in schizophrenia.
ApoD binds and transports arachidonic acid and this way it is an important regulating factor of membrane composite density.
Latter influences the density of dopamine receptors.
Typical and atypical antipsychotics differently affect ApoD expression which may contribute to the deviation between the effects and adverse effects of these drugs.

Methods

Distribution and interactions of D2 TaqI (rs1800497) with genetic variations of PLA2 A1/A2 (rs10798059), nAChR alpha 7 subunit -2bp deletion, COX2 -765G/C, LPL S447X, ApoD intron 2 -352 A/G (rs1568565) and ApoE4 allele were examined.
Synergy factor analysis was used for the examination of gene-gene interaction.
Genetic variants were determined by means of PCR-RFLP from peripheral blood samples of 119 patients with ICD-10 diagnosed schizophrenia and 142 healthy control persons.

Results

None of the investigated genes were associated to schizophrenia independently at a significance level of p<0.05. There were no interaction with PLA2 A1/* (p=0.66), nAChR alpha 7 del/* (p=0.27), COX2 G/* (p=0.53), LPL X/* (p=0.11) and ApoE4/* (p=0.5).

Synergy factor analysis revealed synergistic interaction between D2 TaqI A1/* and ApoD G/* (SF=4.52, p=0.048).

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References


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