Antipsychotic-induced extrapyramidal symptoms: Pilot preventing search of potential genetic predictors in Belarusian population.

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The efficiency and safety of antipsychotic treatment for schizophrenia patients is still a challenge in clinical psychiatry. Investigation of genetic predictors which are involved in antipsychotic response will help treatment optimization and personalization.

Study: Our sample was obtained from an observational, cross-sectional trial of patient diagnosed with paranoid schizophrenia and assessed for antipsychotic-induced parkinsonism and akathisia symptoms using the Extrapyramidal Symptom Rating Scale. Patients were divided into three clinical groups: 1) akathisia side effects only (n=48), 2) parkinsonism side effects only (n=57), 3) no extrapyramidal side effects (n=32). Statistical analyses were conducted in SPSS 22.0.

Aim: To investigated associations of gene polymorphisms: *DRD2* (rs1800497), *CYP2D6*4, GSTM1, GSTT1, SLC6A4* (5HTTLPR), *COMT* (rs4680), *NAT2* (rs1799929), *MDRI* (rs1045642) with extrapyramidal side effects induced by antipsychotics.

Results: There was a significant association of *DRD2* rs1800497 with antipsychotic-induced parkinsonism (χ^2=62,549, p<0,05). Patients with parkinsonism demonstrated a higher frequency of the *DRD2* rs1800497 A2A2 genotype. Antipsychotic-induced akathisia showed more complex genetic contributions. Along with rs1800497 *DRD2* (χ 2=19,02, p<0,05), rs3892097 *CYP2D6*, and deletions in *GSTM1* (χ 2=22,979, p<0,05) and *GSTT1* (χ 2=19,379, p<0,05) were associated with akathisia.

Conclusions: According to the data obtained, mechanism of antipsychotic-induced akathisia may include influence of dopamine receptors functioning (*DRD2*) and xenobiotic toxicity (*GSTM1, GSTT1*) which may be induced by antipsychotic medication.

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Innesa Haylaenka, PhD, Biography:

Innesa Haylaenka is a Senior Scientist Researcher at the Laboratory of Cytoplasmic Inheritance of the Institute of Genetics and Cytology of the National Academy of Sciences of Belarus. She is strongly committed to gaining insights of the genetics of common and complex human diseases. She has been extensively analyzing genetics data from studies of patients with schizophrenia, alcoholism, and patients with first-episode psychosis.

Mrs. Haylaenka and Dr. Victor Objedkov lead a number of research programs in the Republican Research and Practice Center for Mental Health, which is a collaborative effort that focuses on genomic studies of schizophrenia and personalized medicine. Most recently, Innesa's research and training have been heavily focused on antipsychotic treatment response and antipsychotic-induced side effects. Innesa is also a head of the scientific project "Association of Gene Polymorphisms of Neurotransmitter Brain Pathways and Xenobiotic Detoxification Pathways with Treatment Response of Schizophrenia Patients". She is an author of over 80 peer-reviewed scientific publications and abstracts. In addition, she is a co-author of the patent on the method for prediction of acute antipsychotic-induced extrapyramidal side effects of schizophrenia patients, which is currently being implemented into schizophrenia treatment practice in Belarusian healthcare system.

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