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Risk-Factors Influencing Hypersensitivity to the Anesthetic Drugs

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Background: Drug-induced hypersensitivity reactions (DHRs) are of major concern due to their frequent severe nature, high rate of hospital admissions and high mortality. A number of recent studies demonstrated that drug-induced hypersensitivity reactions possess strong genetic predisposition, specifically, different combinations of class I and class II human leukocyte antigens (HLA) and natural killer immunoglobulin-like receptors (KIRs) may be associated with the development of drug allergy. The aim of the study was to identify risk-factors (including HLA/KIR polymorphisms) associated with hypersensitivity to anesthetic drugs.

Methods: Allergy to anesthetic agents were evaluated by skin tests and/or venous blood tests for presence of allergen-specific immune globulins type E (IgE) by Enzyme-linked Immunoassay (ELISA). The skin tests were performed for wide range one of the anesthetic agents and ELISA was done for the corresponding anesthetic groups. HLA/KIR typing was performed by PCR using sequence-specific oligonucleotide probes (SSOP). 450 patients have been included in the study with age range between 4 and 79 years. Special questionnaire was used to collect demographic, family history and clinical data.

Results: Presence of hypersensitivity to one of the anesthetic agents has been found 20.8% of the subjects. By bivariate analysis, the allergic status to anesthetic agent was associated with the presence of allergy to the different types of allergens among patients' mothers or sibships, presence of drug allergy in one or in both patients, presence of food allergy in addition to the drug allergy among patients, presence of current or recent infectious diseases. By multivariate (logistic regression) analysis the presence of allergy in one or both of parents, presence of infections and specific HLA/KIR profile (specifically HLAC1/KIR2DL2, Odds Ratio (OR) =1.51; 95% CI: 1.11-2.62) were associated with the hypersensitivity to anesthetic agents.

Conclusions: Both genetic (family history, immunogentic profiles) and acquired (presence of recent or current infections) are associated with the development of hypersensitivity to anesthetic agents. The obtained data can contribute to the clarification of immunogenetic mechanisms of development of drug-related allergies.

Biography

Tamar Kemoklidze is PhD student of The University of Georgia (PhD program: Public Health) since 2017. Her study is about allergic reactions to local anesthetic agents and risk-factors for their development. Her supervisor is George Kamkamidze. He is professor of department of immunology and infectious diseases of University of Georgia, director of clinic Neolab, head of research department of Health Research Union and head of statistical analysis department of Data Research Group. Tamar works as allergist-immunologist in Aversi Clinic in Tbilisi.. She is invited lecturer in European University and David Agmashenebli University of Georgia. She has published 4 papers in reputed journals. This work was supported by Shota Rustaveli National Science Foundation of Georgia (SRNSF) [PHDF-18-2954, Immunogenetic factors influencing hypersensitivity to the anesthetic drugs], where Tamar received the grant for PhD project in 2018.

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