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Genetic Variants Account for Differences in Responses in Blood Pressure and Blood Flow Values to Laryngoscopy/Intubation/Extubation

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Abstract: Aim: There is a variation in drug response among individuals. In this study, we determined angiotensin-converting enzyme (ACE) insertion/deletion (I/D), beta2-adrenergic receptor (ADRB2) Arg16Gly and dopamine D1 receptor (DRD1) -48 G/A polymorphisms, which are presumed to be related to the transient hypertension induced by the mechanical stimulation of laryngoscopy and tracheal intubation/extubation. Materials and Methods: One hundred American Society of Anesthesiologists (ASA) class I patients were enrolled in this study. Heart rate and blood pressure were recorded before induction (T_0), after induction (T_1), during laryngoscopy/intubation (T_i) and 1, 2, 3, 4 and 5 min thereafter (T_{i-1}-T_{i-5}), before extubation (T_e) and 1, 2, 3, 4 and 5 min afterwards (T^{e-1}-T^{e-5}). ACE I/D, ADRB2 Arg16Gly and DRD1 -48 G/A polymorphisms were investigated by polymerase chain reaction-restriction fragment length polymorphism analyses. Data were analyzed by Repeated Measure Factorial Analysis of Variance. Results: During laryngoscopy, intubation and extubation, blood pressure, heart rate and rate pressure product (RPP) values increased, returning to baseline within five minutes. Increases at Ti were significant for all values when compared to T_o ($p<0.01$, $p<0.001$). At T_i, genotype associations were observed between DRD1 -48GG genotype and systolic and diastolic blood pressures and also between heart rate and ADRB2 Arg/Arg and ACE II. Patients having ACE ID and ADRB2 Arg/Arg and ACE II and DRD1 GG genotypes were associated with a significant increase in diastolic blood pressure and heart rate at T_i, respectively ($p<0.01$, $p<0.001$). Conclusions: These results indicate that single nucleotide polymorphisms in DRD1, ADRB3 and ACE genes may have an impact on hemodynamic changes during laryngoscopy/intubation/extubation.

Key Words: Cardiovascular response, intubation, extubation, polymorphism

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