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Vasodilator Effect of Propofol in Rat Aorta

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Propofol is an intravenous anesthetic that can be used for the induction and maintaining of anesthesia. In this study, it was aimed to investigate the mechanism of vasodilator action of propofol in rat aorta (RA).

The RA rings were suspended in isolated organ bath and tension was recorded isometrically. First, potassium chloride (KCl) and phenylephrine (PE) were added to organ baths to form precontraction. When the precontractions were stable, propofol (1, 10, 100 µM) was added cumulatively to the baths. The antagonistic effect of propofol on KCl (mM), PE (1 µM), 5-hydroxytryptamine (5-HT, 30 µM) and calcium chloride ($CaCl_2$, 10 µM-10 mM)-induced contractions in the vascular rings were investigated. Propofol-induced relaxations were also tested in the presence of the large conductance calcium-activated potassium channel inhibitor tetraethylammonium (TEA, 1 mM), the adenosine triphosphate-sensitive potassium channel inhibitor glibenclamide (GLY, 10 µM), the voltage-sensitive potassium channel inhibitor 4-aminopyridine (4-AP, 1 mM) and the inward rectifier potassium channel inhibitor barium chloride ($BaCl_2$, 30 µM).

Preincubation with propofol (1, 10, 100 µM) did not affect the basal tone but inhibited the KCl, PE, 5-HT and $CaCl_2$-induced contractions. Propofol-induced relaxation was not affected by 4-AP, GLI, $BaCl_2$. But, TEA inhibited propofol-induced relaxations significantly. Comparison among multiple groups was made by using a one-way ANOVA followed by Scheffe's post hoc test to determine significant differences among the means of the data groups.

The propofol induces relaxation in contracted RA and inhibits KCl, FE, 5-HT and $CaCl_2$-induced contractions. The results demonstrate that the mechanism of action of propofol-induced vasodilation in the RA may be related to BK_{Ca} activation.

Keywords: Propofol, Rat Aorta, Potassium Channels, Vasodilation

Biography:

Dr. Arslan is the head of pharmacology department in the Ankara Yildirim Beyazit University. His research interests focus on the experimental pathophysiology and inflammation of pulmonary and cardiovascular systems. He is the PhD supervisor for pharmacology and toxicology students.