

Vasodilator Effect in Human Internal Mammary Artery of Propofol: The Role of Potassium Channels

Seyfullah Oktay Arslan^{1*}, Muhammed Fatih Dogan¹, Oguzhan Yildiz² and Murat Kurtoglu³

¹Ankara Yildirim Beyazit University, Turkey

²Saglik Bilimleri University, Turkey

³Guven Hospital, Turkey

Propofol is an intravenous anesthetic that can be used for the induction and maintaining of anesthesia. The purpose of this study is to investigate the mechanism of the vasodilator action of propofol in the human internal mammary artery (IMA).

The IMA rings were hung in isolated organ baths and the changes in tension were recorded isometrically. Potassium chloride (KCl) and phenylephrine (PE) were added to organ baths to form precontraction. Propofol (1, 10, 100 μ M) was added cumulatively when the precontractions were stable. The antagonistic effect of propofol on KCl (mM), PE (1 μ M), 5-hydroxytryptamine (5-HT, 30 μ M) and calcium chloride (CaCl_2 , 10 μ M-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 μ M), the voltage-sensitive potassium channel inhibitor 4-aminopyridine (4-AP, 1 mM) and the inward rectifier potassium channel inhibitor barium chloride (BaCl_2 , 30 μ M).

Preincubation with propofol (1, 10, 100 μ M) 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.

Present experiments show that propofol relaxes contracted IMA and inhibits the KCl, PE, 5-HT and CaCl_2 -induced contractions. The results demonstrate that the mechanism of action of propofol-induced vasodilation in the IMA may be related to BK_{Ca} activation.

Keywords: Propofol, Internal Mammary Artery, 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.