

# **Study of propofol in bovine aortic endothelium: I. Inhibitory effect on bradykinin-induced intracellular calcium immobilization**

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## **Abstract**

**BACKGROUND:** Propofol has been found to affect the intracellular calcium concentration with clinical manifestations of hypotension and bradycardia. The purpose of this study is to examine the effect of propofol on intracellular calcium immobilization in bovine aortic endothelium under the stimulation of bradykinin. **METHODS:** In order to validate the effect of propofol on the alteration of intracellular calcium concentration, we used the cultured bovine endothelial cells (Gm 7372a) to measure the calcium immobilization within the cells preincubated with or without propofol of clinical concentration. Using Fluo-3 staining and a fluorescence spectrophotometer (confocal microscope), intracellular calcium immobilization was demonstrated by the appearance of "hot spots" within the cytoplasm and perinuclear regions after addition of bradykinin to the cells. The changes of fluorescence density measured within these areas versus the effect of time were analyzed and compared with the cells in control group. **RESULTS:** After addition of bradykinin, intracellular calcium hot spots increased dramatically within seconds and reached a maximal level within 20 seconds. The concentrations of calcium gradually decreased to a constant level after about 3 min following the addition of bradykinin to the cells. With pretreatment of propofol at 0.01 mM and 37 degrees C for 30 min, the immobilization of intracellular calcium from the intracellular stores were significantly inhibited that was demonstrated by the decreased appearance of hot spots when compared with control. **CONCLUSIONS:** Our data demonstrated that under the stimulation of bradykinin, propofol at 0.01 mM, could inhibit intracellular calcium release from the intracellular stores in bovine aortic endothelial cells. This phenomenon might explain the possible mechanism for the clinical manifestations of hypotension and/or bradycardia associated with propofol.