P-0680

Effect of N-acetyl cysteine on conductance of KATP channels in thoracic aorta rings

Fatma Sögüt[1], Ülkü Çömelekoğlu[2], Özden Yeşir[3], Nehir Sucu[4], Şakir Necat Yılmaz[4], Ali Erdinç Yalın[4], Serap Yalın[5]

[1]Mersin University Vocational School of Medical Services, Mersin,Turkey
[2]Mersin University, Faculty of Medicine, Department of Biophysics, Mersin, Turkey
[3]Mersin State Hospital, Mersin, Turkey
[4]Mersin University Faculty of Medicine, Department of Cardiovascular Surgery, Mersin, Turkey
[5]Mersin University, Faculty of Medicine, Department of Histology and Embriology, Mersin, Turkey
[6]Mersin University, Faculty of Pharmacy, Department of Biochemistry, Mersin, Turkey

N-acetyl cysteine (NAC) is a precursor in the synthesis of glutathione and acts as an antioxidant, anti-inflammatory and vasodilating substance [1, 2]. However, the signaling pathway involved in NAC effects is not entirely elucidated. In the present study, we aimed to investigate the effect of N-acetyl cysteine on conductance of KATP channels in thoracic aorta rings by using single channel recordings.

Cultured thoracic aorta cells were used to record KATP channel currents. Cells were divided into four groups as control, 2 mM NAC, 5 mM NAC, and 10 mM NAC. The patch-clamp method was used to record single-channel currents from the cell membrane in the cell-attached mode. Pipette voltage was set to +50 mV, and the experiments were carried out at 37°C. Single-channel currents were recorded. KATP channel conductance was calculated from single channel recordings.

The mean conductance were 48.45±0.36, 59.65 ± 10.45, 61.84 ± 8.31, and 61.29 ± 6.37 pS in the control, 2mM NAC, 5 mM NAC, and 10 mM NAC groups, respectively. In all treatment groups, single channel conductances were significantly larger than that in the control group ($p<0.05$). There were no statistically significant differences between mean current amplitudes in different NAC groups.

In conclusion, N-acetyl cysteine causes hyperpolarization by increasing the outward K+ conductance through KATP channels. This hyperpolarization may be related to vasodilator, antioxidant and antiinflammatory effects of N-acetyl-cysteine in thoracic aorta smooth muscle cells.

This research was supported by the Scientific and Technological Research Council of Turkey (TUBITAK, research grant No. 214S143).

References

[1] Whitlker S Ralfen JE, Chapman B, Kachel PW. Redox Rep, 14(3):115-24, 2009.
[2] Licks F, Hartmann RM, Marques C, Schmitt E, Colares JR, Soares Milo C, Reyes J, Fisher C, da Silva J, Marroni NP. World J Gastrointest, 21(43):1233-60, 2015.

Keywords: N-acetyl cysteine, Katp channels, patch-clamp, vascular smooth muscle


İVEK Uluslararası İlaç ve
IVEK_2017_Bildiri_Kitabi-
ivekkongre.com/IVEK_2017_Bildiri_Kitabi-v6.pdf
IVEK_2017_Bildiri_Kitabi-v6.pdf
1 / 1136
İVEK
ULUSLARARASI
İLAÇ VE
ECZACILIK
KONGRESİ
26-29
NİSAN
APRIL
2017
WOW Istanbul Hotel &
IVEK 3rd International
Convention of Pharmaceuticals
TR
10:09
18.08.2017