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Dapagliflozin Ameliorates Smooth Muscle Cell Proliferation via Endothelial Microparticles Stimulated by Indoxyl Sulfate

Hyeon ho Kim, Seung-Jung Kim, Shina Lee

Department of Internal Medicine-Nephrology, Ewha Womans University Mokdong Hospital, Korea, Republic of

Objectives : Endothelial microparticles (EMPs) are closely associated with vascular dysfunction. Recent research has revealed a link between SGLT2 inhibition and improved endothelial functions. We investigated the effects of dapagliflozin on EMP generation from indoxyl sulfate-stimulated endothelial cells and their impact on smooth muscle cell (SMC) proliferation.

Methods : We measured CD31+CD42-EMP counts by flow cytometry in supernatants of human umbilical vein endothelial cells (HUVECs) incubated with indoxyl sulfate. We examined the EMP responses to dapagliflozin by incubating EMPs from indoxyl sulfate-stimulated HUVECs with or without dapagliflozin.

Results : 1.Indoxyl sulfate induced EMP release in HUVECs. 2.Dapagliflozin inhibited EMP generation induced by indoxyl sulfate. 3.The EMPs induced by indoxyl sulfate stimulated smooth muscle cell proliferation, and this effect was reversed by treatment with dapagliflozin.

Conclusions : Dapagliflozin ameliorates smooth muscle cell proliferation via endothelial microparticles stimulated by indoxyl sulfate. SGLT2i could be a treatment option for neointimal hyperplasia in vascular access stenosis.