ISCP International Society of Cardiovascular Pharmacotherapy
27th INTERNATIONAL SOCIETY OF CARDIOVASCULAR PHARMACOTHERAPY ANNUAL MEETING
Crowne Plaza Hotel, Bucharest, Romania 27-29 October 2022

Effect of vitamin D in experimental pulmonary arterial hypertension in rats: Possible role of eNOS mediated signaling pathways

Harlokesh Narayan Yadav, Sadia Shah
Department of Pharmacology, All India Institute of Medical Sciences, New Delhi, India

Objectives: Vitamin D deficiency is associated with a poor prognosis of pulmonary arterial hypertension (PAH).

Material and Methods: Rats were fed on a vitamin D deficient diet with exposure to filtered fluorescent light to induce vitamin D deficiency in rats. MCT 50 mg/kg was used to induce PAH in rats. Normal rats were divided into vitamin D 100 IU/d pre-treated and 100 IU/d or 200 IU/d treated groups whereas vitamin D deficient rats were treated with 100 IU/d. siRNA was used to silence the vitamin D receptor in HUVEC cells and calcitriol (50 nm) was added to HUVEC cells before and after the exposure of TGF-β (10ng/ml).

Results: The effect of vitamin D 100 IU/d in VDD rats was comparable to 100 IU/d pre-treated and 100 and 200 IU/d treated normal rats measured in terms of hemodynamic, echocardiographic, histological, oxidative stress parameters and expression of eNOS, which were significantly attenuated by administration of L-NAME (20 mg/kg), a selective inhibitor of eNOS. Exposure of TGF-β markedly decreased the expression of eNOS in vitamin D silenced HUVEC cells, which was averted by treatment or pre-treatment of calcitriol (50nM).

Conclusion: Vitamin D is more effective in the treatment of PAH in vitamin D deficient rats in comparison to normal rats and this effect is mediated by eNOS pathway.