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Effect of telmisartan and atorvastatin on angiogenic responsiveness in coronary endothelial cells of normal and streptozotocin induced diabetic rats

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Introduction: Vascular endothelial growth factor (VEGF) mediated therapeutic angiogenesis has been failed to improve cardiac functioning in heart failure patients that may be related to endothelial dysfunctioning. Telmisartan and atorvastatin improves endothelial cell functioning and widely suggested for treatment of cardiovascular diseases.

Objectives: To study effects of telmisartan and atorvastatin treatment on VEGF induced angiogenic responsiveness in coronary endothelial cells (VEGF-ang-res-cEC).

Methods: Male wistar rats were divided into nine groups, normal rats, diabetic rats 30 ds., diabetic rats 60 ds., telmisartan treated normal rats-diabetic rats 30ds.-diabetic rats 60 ds. and atorvastatin treated normal rats-diabetic rats 30ds.-diabetic rats 60 ds. Each group was further divided into two subgroups; sham heart and IR heart. Coronary endothelial cells (cEC) were isolated from each subgroup for study of ang-res-cEC and NO bioactivity.

Results: Telmisartan and atorvastatin treated groups significantly increased VEGF-ang-res-cEC as compared to their respective non treated groups except atorvastatin treated IR heart-diabetic rats 60 ds. Similarly, telmisartan and atorvastatin showed significant increase in VEGF induced NO release from cEC of treated groups as compared to their respective non treated groups except atorvastatin treated IR heart-diabetic rats 60 ds. The effects of telmisartan and atorvastatin were significantly inhibited by pretreatment of cECs with eNOS inhibitor, NG-nitro-l-arginine methylester (l-NAME) and PI3K inhibitor, wortmannin whereas PKC inhibitor, chelerythrine, attenuated effects of atorvastatin only.

Conclusion: Our data suggest that telmisartan improves coronary angiogenic activity in normal, early and late phase diabetic rats via stimulating VEGF/PI3K/eNOS/NO pathway whereas effect of atorvastatin depend on stimulation of VEGF/PI3K/eNOS/NO and VEGF/PKC/eNOS/NO pathway.

Biography

Anita A. Mehta is a Principal in charge, Professor & Head, Department of Pharmacology, L. M. College of Pharmacy and Dean Zone-I, Gujarat Technological University. She has vast research experience in area of cardiovascular diseases and diabetes with over 150 publications. Her contributions to research have been recognized with 21 awards. She has been associated with numerous prestigious research projects of USIEF-Fulbright, UGC, DST and GUJCOST as principal investigator. She is reviewer of numerous national & international journals. She has organized national conference on Pharmacology and World Congress of the international Academy of Cardiovascular Sciences as joint organizing secretary. She has visited Canada for six week under Global International Experience Program. She has delivered scientific talk at Memphis, Minneapolis, Detroit, New York, New Jersey (US) and Glasgow, (UK).

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