

Effect of Telmisartan, Sitagliptin and Tadalafil on Cardiac Dysfunction in Streptozotocin-Induced Diabetic Rats

Thesis Submitted for partial fulfillment of M.D. degree in

Pharmacology By

Eman Ibrahim Ahmed

M.B., B.Ch, M.Sc.

Supervisors

Prof. Sawсан Abd El Aziz Sadek

Professor of pharmacology

Faculty of Medicine

Fayoum University

Prof. Nawal El Sayed El-Gawhary

Professor of pharmacology

Faculty of Medicine

Cairo University

Dr. Mostafa Mahmoud Khodeir

Assist. Prof. of pathology

Faculty of Medicine

Cairo University

Faculty of Medicine

Fayoum University

2013

ABSTRACT

The aim of this work was to study the potential protective effect of Sitagliptin, Tadalafil and Telmisartan on cardiovascular dysfunction in streptozotocin-induced diabetes in rats.

Diabetes mellitus was induced in male albino rats by intraperitoneal injection of streptozotocin STZ (60 mg/kg). Rats were divided into three groups; control group, diabetic group and drug treated diabetic group.

Sitagliptin (100 mg/kg), Tadalafil (4 mg/kg) and Telmisartan (5 mg/kg) were administered orally daily for 8 weeks to study their effects on blood glucose level, blood pressure, heart rate, echocardiographic data and histopathological analysis of cardiac tissue.

Results revealed that Serum level of glucose was decreased significantly with Sitagliptin and Telmisartan but not with Tadalafil. The three selected drugs significantly reduced the diabetes induced elevation in systolic blood pressure.

Echocardiographic data showed significant increase in ejection fraction (EF) and fractional shortening (FS) in the three drug- treated groups as compared to diabetic group. There was significant increase in both EF% and FS% in both Sitagliptin and Tadalafil treated diabetic groups compared to Telmisartan treated diabetic group

Histopathological examination by the light microscopy using Hematoxylin and Eosin revealed myocyte hypertrophy in STZ-diabetic rats which was markedly decreased in all treated groups. Sections stained by Masson's Trichrome showed mild interstitial fibrosis in the diabetic

group which was ameliorated by Telmisartan and Sitagliptin but not Tadalafil.

Both Sitagliptin and Tadalafil were more effective than Telmisartan in improving the systolic function in the form of significant increase in EF and FS. However, both Telmisartan and Sitagliptin were superior to Tadalafil in ameliorating the diabetic- induced interstitial fibrosis while the three drugs were equally effective in decreasing the cardiac hypertrophy.

Key Words: Diabetes mellitus, cardiomyopathy, Telmisartan, Sitagliptin
Tadalafil