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Thesis Title	<b>Evaluation The Effects of Metformin and Sitagliptin on Cerebral Vasoreactivity in Diabetic Patients (Type 2) By Transcranial Doppler: A Comparative Clinical Study</b>			
Year	2016			
Abstract	<p>Diabetes mellitus type 2 increases the risk of stroke 3 folds. It do so by inducing endothelial injury and accelerated atherosclerosis. Early diagnosis and treatment lower the risk of stroke. Transcranial Doppler examination applied with certain physiological tests can be used to test vasoreactivity of intracranial arteries. Impaired cerebral vasoreactivity can predict the risk of stroke. Therefore , this diagnostic test can be used for evaluation the effect of oral hypoglycemic drugs on risk of stroke.This study was conducted for evaluation and comparison of the effects of metformin, sitagliptin and their combination on cerebrovascular reactivity in patients with newly diagnosed type 2 diabetic patients.A total of 79patients were involved in this study. They are all with newly diagnosed type 2 diabetes mellitus.They were divided into four groups; control, metformin, sitagliptin and combination. A verbal consent were taken from each participant. Control group includes twenty patients and was treated with dietary control and regular exercise. Metformin group includes twenty patients and was treated with metformin 500mg twice daily plus dietary control and exercise. Sitagliptin group includes nineteen patients and was treated with sitagliptin 50mg twice daily plus dietary control and regular exercise. Finally, combination group includes twenty patients and was treated with dietary control and regular exercise plus metformin 500mg with 50mg of sitagliptin twice daily. Treatment duration was three months. Biochemical tests were done before and after treatment.Measurement of hemodynamic parameters including systolic, diastolic and mean velocities with pulsatility and resistive indices was done by transcranial Doppler before and after treatment.Vasoreactivity measures which include breath-</p>			

holding index, FRVD and transient hyperemic response rate ,all were recorded for each patient before and after treatment.

In control group, there was significant statistical increase in breath-holding index from (p=0.008). In metformin group, breath-holding index also significantly increased (p<0.000). In sitagliptin group, breath holding index showed significant increase (p<0.000). Finally, combination group showed highest level after treatment among study group (p<0.000). Regarding FRVD; control group revealed insignificant statistical difference after treatment (p=0.702). Metformin group showed increase in FRVD it was statistically insignificant (p=0.071). Sitagliptin group exhibited non-significant statistical difference in FRVD (p=0.701). On the other hand, combination group revealed significant statistical increase in FRVD(p=0.001).In control group, THRR increased after treatment but it was insignificant change (p=0.209). Metformin group showed increase in THRR which was significant change (p=0.019). Sitagliptin group showed significant increase in THRR (p<0.000). Finally, combination group showed significant statistical increase in THRR (p=0.0003) which was the highest value among groups after treatment.From the results obtained in this study we can conclude that treatment with metformin plus sitagliptin increase all parameters of cerebral vasoreactivity in this study. Furthermore, decrease in fasting blood sugar and Hb<sub>A1c</sub>correlates inversely with increase in breath-holding index after treatment.