Summary And Conclusion

Angiotensin II receptor antagonists represent a new pharmacological class of antihypertensive drug. This work was done to compare between two members of this group; losartan and telmisartan on their effects on isolated perfused rabbit's heart and on isolated perfused rabbit's aortic spiral strip in vitro, and their effects on arterial blood pressure, heart rate and renal hemodynamic in uninephrectomized DOCA-salt hypertensive rats in vivo.

It was found that losartan produced significant inhibition of the force of contraction of the isolated perfused rabbit's heart. On the other hand telmisartan produced significant increase of force of contraction of the isolated perfused rabbit's heart. Meanwhile, both drugs block the positive inotropic effect produced by angiotensin II on the isolated rabbit's heart.

Also, losartan and telmisartan produced significant decrease on the angiotensin II induced contractions of isolated rabbit's aortic spiral strip. However, telmisartan produced more significant decrease than losartan. Meanwhile neither losartan nor telmisartan has effect on norepinephrine induced contractions of isolated rabbit's aortic spiral strip.

As regards the in vivo study, rats were used and divided into four equal groups: Control group, uninephrectomized DOCA-salt hypertensive group, uninephrectomized DOCA-salt hypertensive group treated with losartan (20mg/kg orally for 2 weeks) and uninephrectomized DOCA-salt hypertensive group treated with telmisartan (10mg/kg orally for 2 weeks).

The induction of hypertension was done by unilateral nephrectomy and subcutaneous injection of DOCA for six weeks. At the end of the study period, the rats in each group were subdivided for 2 subgroups one for measuring the arterial blood pressure by pressure transducer oscillograph, and the second for measuring the heart rate and studying the renal hemodynamic by pulsed blood flowmeter (Doppler).

It was found that losartan and telmisartan produced a significant reduction in systolic and diastolic blood pressure in uninephrectomized DOCA-salt hypertensive rats, and telmisartan produced more significant reduction than losartan in systolic and diastolic blood pressure in uninephrectomized DOCA-salt hypertensive rats.

Also both drug produced insignificant reduction in heart rate in uninephrectomized DOCA-salt hypertensive rats.

As regard their effect in renal hemodynamic, losartan and telmisartan produced significant increase in mean blood flow velocity and significant decrease in resistance parameter, pulsatility index, maximum systole, and systole/diastole ratio in renal artery, while, maximum diastole was significantly decreased by losartan and insignificantly decreased by telmisartan in uninephrectomized DOCA-salt hypertensive rats. Comparing telmisartan to losartan; telmisartan was found to produce more significant increase in mean blood flow velocity and insignificant more decrease in resistance parameter, pulsatility index and systole/diastole ratio and insignificant less decrease in maximum systole and maximum diastole in uninephrectomized DOCA-salt hypertensive rats.

In conclusion, losartan and telmisartan blocked the positive inotropic effect produced by angiotensin II on the isolated rabbit's heart. Both drugs reduced the angiotensin II induced contractions in isolated rabbit's aortic strip. Also losartan and telmisartan are effective drugs in lowering high blood pressure without significant effect on heart rate and with beneficial effect on renal heodynamics. Telmisartan is more potent than losartan in all these parameters and with a positive inotropic effect on isolated rabbit's heart. These effect may be useful in prevention and treatment of heart failure and this is still under investigation.