

**Potential cardiovascular and renal protective effects of Vitamin D and Coenzyme Q10 in L-NAME induced hypertensive rats: add-on therapy**

**Abstract:**

**Background:** Hypertension is one of the primary modifiable risk factors for cardiovascular disease. Adequate vitamin D (vit D) levels have been shown to reduce vascular smooth muscle contraction and to increase arterial compliance, which may be beneficial in hypertension. Further, coenzyme Q10 (COQ10) through its action to lower oxidative stress has been reported to have beneficial effects on hypertension and heart failure. This study examined the possible cardiac and renal protective effects of vit D and COQ10 both separately and in combination with an angiotensin II receptor blocker, valsartan (vals) in L-NAME hypertensive rats. **Materials and Methods:** Hypertension was induced in rats by L-NAME administration. Following induction of hypertension, the rats were assigned into the following 6 subgroups: L-NAME alone and treated groups receiving the following drugs intraperitoneally for 6 weeks; vals, vit D, COQ10 and combination of vals with either vit D or COQ10. A group of normotensive rats were used as negative controls. At the end of the treatment period, blood pressure, serum creatinine, blood urea nitrogen, lipids and serum, cardiac and renal parameters of oxidative stress were measured. **Results:** Compared to the L-NAME only group, all treatments lowered systolic, diastolic, mean arterial pressure, total cholesterol, low-density lipoprotein cholesterol, creatinine levels as well as TNF- $\alpha$  and malondialdehyde. Further, the agents increased serum, cardiac and renal total antioxidant capacity. Interestingly, the combination of agents had further effects on all the parameters compared to treatment with each single agent. **Conclusions:** The study suggests that the additive protective effects of vit D and COQ10 when used alone or concurrent with vals treatment in hypertensive rats, may be due to their effects as antioxidants, anticytokines and blood pressure conservers.