English Summary

Study of the possible cardiovascular protective effects of certain biologically active natural products on experimentally induced hypertension in rats

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Hypertension is the most common modifiable risk factor for cardiovascular disease. Lowering blood pressure (BP) reduces target organ damage and prevents cardiovascular disease outcomes.

The aim of the present work was to examine the possible anti-hypertensive effect of curcumin (CUR) and ellagic acid (EA), as well as, investigating their influence on some vascular and biochemical changes brought by L-NAME-induced hypertension in rats.

The main findings of the present work were as follows:

I- L-NAME-induced hypertension

Oral administration of L-NAME (50 mg/kg/day) succeeded to elevate SBP, starting from the second week, reaching a peak by the end of the fourth week and then maintained throughout the experimental period. No further increases in SBP was observed thereafter.

L-NAME-induced hypertension was associated with:

- Oxidative stress imbalance which was evidenced by the following:
  - Decreased erythrocytic GSH-Px activity.
  - Decreased serum Pr-SHs level.
  - Increased serum lipid peroxidation products measured as MDA.
- Decreased NOS activity and NO bioavailability that was proved by decreased level of serum nitrate/nitrite, the end products of NO metabolism.
- Increased vascular reactivity towards the vasoconstrictor, NE.
- Impairment of endothelium-dependent vasorelaxation induced by Ach.

II-CUR treated LNH-rats

- Oral treatment of LNH-rats with CUR (100 mg/kg/day) for 4 weeks showed normalization of elevated SBP and resulted in:
  - Raised erythrocytic GSH-Px activity
  - Increased serum level of total Pr-SHs.
  - Reduction in serum MDA level.
- Restoration of NOS activity, which was evidenced by increased serum NO_X level.
- Reduction of NE-induced contractions along the whole concentration- response curve
- Improved endothelial-dependent vasodilatation induced by Ach.

III- EA treated LNH-rats

Oral treatment of LNH-rats with EA (7.5, 15, 30 mg/day) for 4 weeks showed a dose-dependent reduction in the elevated SBP starting from dose level 15 mg/kg. However, LNH-rats treated with EA at dose of 30 mg/kg/day displayed normal SBP. So, this dose was selected for further investigations.

EA (30 mg/kg) administration was accompanied by:

- Reduction in the oxidative stress which was evidenced by:
  - Raised erythrocytic anti-oxidant enzyme GSH-Px activity.
  - Increased serum Pr-SHs level.
  - Reduction in the serum MDA level that prove reduction in lipid peroxidation.
- Re-establishment of NOS and NO production that were verified by increased serum NO_X level.
- Enhanced endothelium-dependent vasorelaxation as well as reduced contractions induced by the vasoconstrictor, NE.