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Change of serum klotho protein and its relationship with endothelial dysfunction, oxidative stress and arterial aging in essential hypertensive patients

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Background: Klotho is recognized as an anti-aging protein, protects the cardiovascular system through endothelium-derived NO. Klotho deficiency disturbs endothelial integrity, but the molecular mechanism is not fully clarified.

Objectives: The objectives of the study were to observe the relationship between klotho protein and biochemical marker of oxidative stress, endothelial dysfunction and arterial aging in non-treated and ACEI-treated patients with essential hypertension (EH).

Subjects & Methods: In this case, 80 subjects with essential hypertension, divided into two groups the first didn't receive any hypertensive treatment (n=40) while the other (n=40) received angiotensin converting enzyme inhibitors (ACEIs), and 20 age and sex matched controls were included in the study. Serum levels of nitric oxide (NO), malondialdehyde (MDA), vascular endothelial growth factor-A (VEGF-A) and klotho protein were measured. Carotid intima-media thickening (IMT) was determined by ultrasonography for all participants.

Results: Mean values of MDA, VEGF-A and IMT revealed significant increment, while those of NO and klotho showed significant reduction in non-treated EH patients compared to controls. Mean levels of MDA, VEGF-A and IMT showed significant reduction, while those of NO and klotho exhibited significant elevation in ACEI-treated patients compared to corresponding values of non-treated ones. Significant negative correlation between serum MDA concentration and NO levels and positive correlation between klotho level and NO were observed in the present study.

Conclusion: Soluble klotho may become an important target in vascular medicine, mainly in situations where senescence and stress are responsible for accelerated vascular damage as in hypertension. The addition of exogenous klotho may prevent the oxidative stress that induces premature senescence.

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