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Genistein changes Klotho protein expression and PTH level in an animal model of the andropause

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Antiageing Klotho protein has a multiple regulation functions, including the one in the mineral homeostasis. It is expressed in the kidneys, parathyroid glands and choroid plexus. Phytoestrogen genistein is recognised for the prevention of osteoporosis. The aim of this study was to examine the effects of genistein on the Klotho expression in the kidneys and related mineral and parathormone concentrations, in an animal model of the andropause.

Wistar male rats (16-month-old) were divided as follows: sham operated (SO), orchidectomized (Orx) and genistein treated orchidectomised (G) group. Genistein (30 mg/kg b.w.) was subcutaneously applicated, while the control groups received the vehicle alone. Kidney Klotho expression was assessed by RT-PCR and Western blot, while the serum and urine parameters were determined biochemically.

Serum Ca2+ and Pi concentrations were decreased after Orx, while urine Ca2+ and Pi concentrations were increased after Orx, when compared to SO group. Orx caused increase of parathormone concentration in comparison with SO animals, while G decreased the same parameter compared to Orx rats. G increased the serum Ca2+ and Pi concentrations, while Ca2+ and Pi urine concentrations were decreased comparing to Orx animals. Finally, G induced the increase of the Klotho mRNA together with the increase of protein expression when compared to Orx group.

Our results demonstrated that genistein treatment increases Klotho expression in the kidney of andropausal rats. Presented data encourage some further investigations with a view to explore the exact mechanism of genistein action in the kidneys, important for treatment of disturbed mineral homeostasis in andropause.