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EFFECTS OF TWO NATURAL XANTHONES ON URINARY CALCIUM OXALATE CRYSTALLIZATION: *IN VITRO* AND *EX VIVO* STUDIES

Luísa N. Bolda Mariano[1]*, Thaise Boeing[1], Rita de Cássia M. V. A. F. da Silva[1], Valdir Cechinel-Filho[1], Rivaldo Niero[1], Luisa M. da Silva[1], Sérgio F. de Andrade[1], Priscila de Souza[1]

[1]*Programa de Pós-graduação em Ciências Farmacêuticas, Universidade do Vale do Itajaí, SC, Brasil.* *luhbolda_@hotmail.com.

INTRODUCTION

This study aimed to investigate the inhibitory effect of 3-demethyl-2-geranyl-4-prenylbellidypholine xanthone (DGP) and 1,5,8-trihydroxy-4′,5′-dimethyl-2H-pyrano(2,3:3,2)-4-(3-methylbut-2-enyl) xanthone (TDP) on the urinary calcium oxalate crystallization model by using *in vitro* and *ex vivo* approaches.

MATERIAL AND METHODS

Firstly, we explored the *in vitro* urinary CaOx formation in which the samples were divided into different aliquots, one of them was used as control (crystallization without DGP, TDP and potassium citrate) while in the others, CaOx precipitations were induced in the presence of DGP (0.03, 0.1 and 0.3 mg/kg), TDP (0.03, 0.1 and 0.3 mg/kg), HCTZ (10 mg/kg) and potassium citrate (CK; 10 mg/kg). These treatments were added to the synthetic urine samples before crystallization process. The inhibitory effects of samples were determined based on the spectrophotometric assay in time 60 min after adding sodium oxalate at 37°C, and morphology of crystals were analyzed by light microscopy. Posteriorly, the same procedure was performed with the 7-day cumulative urine of NTR (normotensive rats) and SHR (hypertensive rats) treated with VEH (vehicle), DGP and TDP (0.1 mg/kg), or HCTZ (10 mg/kg). Authorization from CEUA/UNIVALI: 028/17p.

RESULTS

The *in vitro* results, by using synthetic urine, showed that CK decreased the number of CaOx crystals when compared to the control sample. The HCTZ was also able to decrease the number of CaOx crystals, demonstrating to be more effective than CK. TDP decreased the number of CaOx in all concentrations (0.03, 0.1 and 0.3 mg/kg) and decreased the absorbance values at 0.3 mg/kg. In contrast, the DGP was not able to decrease the number of CaOx or absorbance. On the other hand, the *ex vivo* results, by using the urines samples collected from the rats for 7 days, showed that the treatment with HCTZ diminished the number of CaOx crystals formation compared with the VEH-treated only NTR or SHR group. Similarly, the treatment with DGP was able to decrease the number of crystals in both NTR and SHR urine samples. Additionally, the treatment with TDP reduced the number of crystals formation in NTR group.

CONCLUSIONS

This study shows that the xanthone TDP exerted protective effects on CaOx formation *in vitro*. Besides, both TDP and DGP treatments exhibited antiurolithiatic properties in a model of *ex vivo* urinary calculus.

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