

Boldine improves kidney damage in the goldblatt 2K1C model avoiding the increase in TGF- β 1

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Boldine, a major aporphine alkaloid found in the Chilean boldo tree, is a potent antioxidant. Oxidative stress plays a detrimental role in the pathogenesis of kidney damage in renovascular hypertension (RVH). The activation of the renin-angiotensin system (RAS) is crucial to the development and progression of hypertensive renal damage and TGF- β 1 is closely associated with the activation of RAS. In the present study, we assessed the effect of boldine on the progression of kidney disease using the 2K1C hypertension model and identifying mediators in the RAS, such as TGF- β 1, that could be modulated by this alkaloid. Toward this hypothesis, rats (n = 5/group) were treated with boldine (50 mg/kg/day, gavage) for six weeks after 2K1C surgery (pressure \approx 180 mmHg). Kidney function was evaluated by measuring of proteinuria/creatininuria ratio (U prot/U Crea), oxidative stress (OS) by measuring thiobarbituric acid reactive substances (TBARS). The evolution of systolic blood pressure (SBP) was followed weekly. Alpha-smooth muscle actin (α -SMA) and Col III were used as markers of kidney damage; ED-1 and osteopontin (OPN) were used as markers of inflammation. We also explored the effect in RAS mediators, such as ACE-1 and TGF- β 1. Boldine treatment reduced the UProt/UCrea ratio, plasma TBARS, and slightly reduced SBP in 2K1C hypertensive rats, producing no effect in control animals. In 2K1C rats treated with boldine the levels of α -SMA, Col III, ED-1, and OPN were lower when compared to 2K1C rats. Boldine prevented the increase in ACE-1 and TGF- β 1 in 2K1C rats, suggesting that boldine reduces kidney damage. These results suggest that boldine could potentially be used as a nutraceutical. © 2018 by the authors. Licensee MDPI, Basel, Switzerland.

(S)-2,9-dihydroxy-1,10-dimethoxy-aporphine

Chronic kidney disease

Fibrosis

Oxidative stress

Renovascular hypertension

AbD Serotec

alpha smooth muscle actin

boldine

collagen type 3

creatinine

dipeptidyl carboxypeptidase

monoclonal antibody

osteopontin

potassium

reactive oxygen metabolite

sodium

thiobarbituric acid reactive substance

transforming growth factor beta

aporphine derivative

boldine

transforming growth factor beta

adult

animal experiment

animal model

animal tissue

antioxidant activity

Article

controlled study

creatinine clearance

drug efficacy

drug mechanism

enzyme linked immunosorbent assay

immunohistochemistry

inflammation

kidney function

kidney injury

male

nonhuman

oxidative stress

plethysmography

protein expression

rat

renin angiotensin aldosterone system

renovascular hypertension

systolic blood pressure

urinary excretion fraction

Western blotting

animal

chemistry

drug effect

genetics

human

injuries

kidney

kidney disease

pathology

Peumus boldus

renovascular hypertension

Animals

Aporphines

Humans

Hypertension, Renovascular

Kidney

Kidney Diseases

Oxidative Stress

Peumus

Rats

Renin-Angiotensin System

Transforming Growth Factor beta