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File: ■ Hibiscus (*Hibiscus sabdariffa*, Malvaceae)
■ Hypertension
■ Renin-angiotensin-aldosterone System

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RE: Hibiscus Tea Reduces Hypertension Comparable to Lisinopril

Nwachukwu DC, Aneke EI, Obika LF, Nwachukwu NZ. Effects of aqueous extract of *Hibiscus sabdariffa* on the renin-angiotensin-aldosterone system of Nigerians with mild to moderate essential hypertension: A comparative study with lisinopril. *Indian J Pharmacol*. 2015;47(5):540-545.

The renin-angiotensin-aldosterone system (RAAS) is an important homeostatic mechanism for regulating blood pressure. Hibiscus (*Hibiscus sabdariffa*, Malvaceae) calyx aqueous extract has antihypertension activity and may work via the RAAS. The purpose of this randomized, controlled study was to evaluate the effect of hibiscus water extract on components of RAAS as compared with lisinopril, a blood pressure medication and a known inhibitor of angiotensin-converting enzyme (ACE).

Patients with mild to moderate hypertension (n = 75; aged 31-70 years) were recruited at the Medical Outpatient Clinic of Enugu State University Teaching Hospital, Parklane; Enugu, Enugu State, Nigeria. Included patients were newly diagnosed with mild to moderate hypertension according to the World Health Organization–International Society of Hypertension and were untreated. Excluded patients had diabetes, nephropathy, cardiopathy, hepatic disease, cancer, were pregnant, had secondary hypertension, were chronic smokers, or were alcoholics. For 4 weeks, patients received either placebo (150 mg/kg Ribena® fruit drink, which was diluted to create a color resembling the hibiscus infusion; Suntory; Osaka, Japan), 10 mg/day lisinopril (Zestril®; Reals Pharmaceuticals; Ikeja, Lagos State, Nigeria), or 150 mg/day hibiscus infusion made by the authors. Dried hibiscus calyces were purchased from Ogbete Main Market; Enugu, Enugu State, Nigeria. Twenty grams of dried calyces were infused in 1 L of water for 30 minutes. Plasma renin, serum ACE, plasma aldosterone (PA), and blood pressure were monitored weekly.

Two patients in the placebo group had an increase in blood pressure and withdrew from the study. In the lisinopril group, 3 patients developed a cough and withdrew from the study. No adverse events were reported.

A total of 76% of the hibiscus group and 65% of the lisinopril group had normalized blood pressure. Compared with placebo, the hibiscus group had a significant decrease in systolic blood pressure at week 2 ($P < 0.01$), week 3 ($P < 0.001$), and week 4 ($P < 0.001$), and decreased diastolic blood pressure at week 4 ($P < 0.001$). The lisinopril group had significantly decreased systolic and diastolic blood pressure at week 4 ($P < 0.05$ and $P < 0.001$, respectively) compared with placebo. At week 4, the hibiscus group had a significantly greater decrease in systolic blood pressure compared with the lisinopril group ($P < 0.05$), but there was no significant difference between the 2 groups in diastolic blood pressure. Plasma renin increased and serum ACE decreased in both treatment groups, but there were no significant differences compared to placebo or between the 2 groups. PA significantly decreased in both treatment groups compared with placebo ($P < 0.001$), but they were not significantly different from each other. The hibiscus extract had twice the magnesium concentration as placebo.

The authors conclude that hibiscus extract has a similar mechanism of action as lisinopril in Nigerian patients with mild to moderate hypertension. The hibiscus extract could be working via its high magnesium content, ACE inhibition, and angiotensin II type 1 receptor antagonism. A limitation of the study is that the results in Nigerian patients may not be transferable to other ethnic/racial groups. It is well known that incidence and risk of hypertension and cardiovascular disease has ethnic/racial variability. Nonetheless, in the Nigerian patient population, the hibiscus water extract may be an efficacious and cost-effective treatment option. Additional studies are needed to confirm the findings. The authors have no conflicts of interest.

—Heather S. Oliff, PhD

Referenced article can be accessed at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4621677/.