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Komentar

Putting The Herbal Medicine into The Modern Anti-Hypertension Armamentarium: *Hibiscus Sabdariffa* for Hypertension?

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Herbal medicine has been moving from fringe to mainstream use with a substantial number of patients seeking remedies, which free from side effects caused by synthetic chemical medicines. Recently, professional societies try to utilize eco-friendly and bio-friendly plant-based products for the prevention and cure of degenerative disease, such as: hypertension, diabetes and cancer.[1] It has been known that synthetic chemical medicines used in the above generative disease is not free from adverse effects, let alone the usage of those medicines should be long standing.

Considering the adverse effects of synthetic chemical medicines, the Western medical societies arenow looking for natural remedies, which are considered to be safe and clinically effective. It has been documented that approximately 80% of the global population has faith in traditional medicine, particularly plant drugs for their primary healthcare.[1,2]

Undoubtedly, the plant kingdom still has a lot of species of plants containing substances of medicinal values that have yet to be discovered. Indonesia is an archipelago, which has millions of biodiversity in the world. The flora of Indonesia consists of many unique varieties of tropical plants. Blessed with a tropical climate and around 18,000 islands. The flora reflects an intermingling of Asian, Australian and the native species. This is due to its geography, which located between two huge continents, Asia and Australia. There are about 28,000 species of flowering plants across the country, consisting 2500 kinds of orchid, 6000 traditional medicinal plants used as 'jamu'.

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In regard to hypertension, there had been a number of species and genuses of herb reporting diuretic effect.[4] Of these, the most promising at the present time, are the species *Foeniculum vulgrae, Hibiscus sabdariffa, Petroselinum sativum* and *Spergularia purpurea* and species from the genuses *Cucumis (Cucumis melo and Cucumis trigonus), Equisetum (Equisetum bogotense, Equisetum fluviatile, Equisetum giganteum,* and *Equisetum myriochaetum), Lepidium (Lepidium latifolium* and *Lepidium sativum), Phyllanthus (Phyllantus amarus, Phyllantus corcovadensis* and *Phyllantus sellowianus).*[4] Unfortunately, there the number of studies is limited. Such evidence is really needed to provide scientific credence to the folklore use of herbal medicines and even be helpful in the development of future medicines, and treatments guidelines.An exhausted effort to put the herbal medicine, such as: *Hibiscus sabdariffa* into the modern armamentarium should ideally pursue the scientific steps.

Hibiscus sabdariffa (Syn: Roselle, Rozelle, Indian sorrel, sour tea and Karkade) belongs to the Malvaceae family; it has long been used in indigenous system of medicine for treating hypertension.[5] It is an annual or perennial herb or woody-based sub-shrub that grows to around 2 m tall. Its leaves are lobed, roughly 8 – 15 cm in length and are alternately arranged along a stem. The flowers of this genuses are 8 – 10 cm across, have a whitish-yellow appearance and a dark red spot at the base of each petal. At the base of the petals, there is a stout fleshy red calyx (~ 1.5 – 2 cm in width) that brightens as the fruit matures.[6,7] Several studies have assessed its diuretic capabilities. Odigie *et al.* (2003) assessed its effects on blood pressure (BP) in renovascular hypertensive rats. Rats were compared with sham-operated rats and placebo group. At the end intervention, BP in the hypertensive rats receiving *Hibiscus sabdariffa* and sham-operated rats was similar (mean arterial pressure were 109 and 107 mmHg), but lower than the pressure in those rats ingesting placebo (147 mmHg).The compound presents in *Hibiscus sabdariffa* as quertin had effect on vascular endothelium causing nitric oxide release, increasing renal vaso-relaxation by increasing kidney filtration. Therefore, the diuretic effect may be mediated by nitric oxide release.[8]

Another study demonstrated that *Hibiscus sabdariffa* has a vasodilator effect in the isolated aortic rings of hypertensive rats. These effects are probably mediated through the endothelium-derived nitric oxide-cGMP-relaxant pathway and inhibition of calcium (Ca^{2+})-influx into vascular smooth muscle cells.[9]

Aqueous extracts of *Hibiscus sabdariffa* was also capable of reducing lipid peroxidation, increasing catalase and glutathione activities in diabetic kidney. In histological examination, this extracts improved hyperglycemia-caused osmotic diuresis in renal proximal convoluted tubules of diabetic rats. The study also revealed that up-regulation of Akt/Bad/14-3-3γ and NF-κB-mediated transcription might be involved. Thus, *Hibiscus sabdariffa* is considered to possess the potential effects to ameliorate diabetic nephropathy via improving oxidative status and regulating Akt/Bad/14-3-3γ signaling.[10]

In order to translating these basic evidences to the clinical study, the group of Aceh investigators in this Journal Kardiologi Indonesia assessed the clinical efficacy of *Hibiscus sabdariffa* in reducing BP in elderly hypertensive women. Their hypothesis stated that BP reduction would be achieved through increased expression of nitric oxide. Design of the study was '*pre-post test design with control group*'. The study was conducted in Rumoh Sejahtera of Banda Aceh from June – December 2011. Although they showed that *Hibiscus sabdariffa*probably decrease BP in elderly hypertensive women, but theyfailed to prove the association of nitric oxide release in BP reduction.

To assess whether a clinical study is regarded as 'true experiment', it should includes requirements: (1) *pre-post test design*, (2) *a treatment group* and *a control group,* (3) *random assignment* of study participants. If a clinical study lack one or more these design elements, it is categorized just*'a quasi-experimental study'.* However, interpreting the causation in such study should be done with caution since we cannot be sure that the differences in this design are causally related to the intervention. The other shortcomings of the study are such as; a) small sample size and, b) no concealed randomization conducted, c) control group was representing non-hypertensive subjects. Anyway, this initiative to start with this clinical study using 'the original Indonesian herb' should be credited, as proverb says ***'a bird in hand is worth two in the bush'.***

References

1. Dubey NK, Kumar R, Tripathi P. Global promotion of herbal medicine: India's opportunity. Current Science 2004; 86 (1): 37 – 41.

2. Gijtenbeek JMM, Vanden Bent MJ, Vecht CJ. Cyclosporine neurotoxicity. J Neurol 1999; 246: 339 – 346.
3. Johnson WC and William OW. Warfarin toxicity. J Vasc Surg 2002; 35: 413 – 421.
4. Wright CI, Van-Buren L, Kroner CI, et al. Herbal medicine as diuretics: A review of the scientific evidence. J of Ethnopharmacology 2007; 114: 1 – 3.
5. Oliver B. Medicinal plants in Nigeria. Being a Course of Four Lectures Delivered in April 1959 in the Pharmacy Department of the Nigerian College of Arts, Science and Technology. 1960, Ibadan, p. 16 – 42.
6. Odigie IP, Ettarh RR, Adigun SA. Chronic administration of aqeous extract of *Hibiscus sabdariffa* attenuates hypertension and reverse cardiac hypertrophy in 2K-1C hypertensive rats. J of Ethnopharmacology 2003; 86: 181 – 185.
7. Onyenekwe PC, Ajani EO, Ameh DA, et al. Antihypertensive effect of roselle *(Hibiscus sabdariffa)* calyx infusion in spontaneously hypertensive rats and a comparison of its toxicity with that in Wistar rats. Cell Biochemistry and Function 1999; 17: 199 – 206.
8. Alarcón-Alonso J, Zamilpa A, Alarcón Aguilar F, et al. Pharmacological characterization of the diuretic effect of *Hibiscus sabdariffa* Linn (Malvaceae) extract. J of Ethnopharmacology 2012; 139: 751 – 756.
9. Ajay M, Chai HJ, Mustafa AM, et al. Mechanisms of the anti-hypertensive effect of *Hibiscus sabdariffa* L calyces. J of Ethnopharmacology 2007; 109: 388 – 393.
10. Wang SC, Fen Lee S, Wang CJ, et al. Aqueous Extract from *Hibiscus sabdariffa* Linnaeus Ameliorate Diabetic Nephropathy via Regulating Oxidative Status and Akt/Bad/14-3-3γ in an Experimental Animal Model. Evidence-Based Complimentary and Alternative Medicine 2011; doi:10.1093/ecam/nep181.