

Plants and herbs for therapy of diabetes

Laurentius A. Pramono

Department of Internal Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

Nowdays, many plants and herbs are believed and proved to have blood glucose lowering effect. The phenomenon called “traditional medicine” or “back to nature” is growing and becoming popular in the society with low level of education and the need of other treatment besides ‘chemistry agents’. As clinicians and researchers, we must put evidences and pathophysiology (biologic plausibility) in the first place before giving patients suggestion for consuming plants or herbs for treatment of diabetes.

Diabetes in low resource countries

Diabetes is a major public health problem nowadays.^{1,2} According to the latest International Diabetes Federation (IDF) Atlas (2014), prevalence of diabetes all over the world reaches 8.3%, with 46.3% undiagnosed cases. Globally, in 2014, 387 millions people living with diabetes and it has been estimated in 2015, this number will increase up to 592 millions people. Diabetes prevalence in Indonesia reaches 5.81% with 9,116,030 people living with diabetes.² The popularity of diabetes is very high, set this disease to become a global concern for many healthcare professionals, educators, pharmacists, scientists, and traditional healers all over the world.^{3,4} It is established that treatment for diabetes need multidisciplinary approach.⁴

Diabetes is treated from the level of primary care physician, family physician, internist, and endocrinologist.⁵ In many remote rural areas with low human resources, sometimes paramedics (nurses, midwives, even traditional healers) give treatment for diabetes patients.^{6,7} This phenomena also occur in remote rural areas in Indonesia.⁶ Since in several remote villages there are only glibenclamide which is available in the primary health cares, health practitioners always suggest glibenclamide for the treatment of diabetes as if the drug is the only drug used for diabetes. This pitifull condition continue from time to time without any evaluation of

blood glucose (no monitoring), complication examination, and titration of doses and intensification of treatment, while blood glucose control has not achieve the target. The situation undoubtedly will bring to poor glycemic control and increase of complications in patients living in remote and rural areas all over the world.⁸

Diabetes is a syndrome with many complicated aspects, from new pathophysiology, diagnosis, complication prevention, and novel treatments.^{9,10} The advancement of technology in diabetes treatment worldwide sometimes not followed by accessibility of diabetes patient to get standard diagnostic and treatment, such as portable glucometer for self monitoring blood glucose (SMBG), good quality laboratory for HbA1c examination, and also complete medications for diabetes.⁸ In Indonesia primary healthcare facilities, as been said previously, only glibenclamide and sometimes metformin is available. In some districts, insulin is not available at all, even in the government hospitals. At the end, this condition and myths about diabetes in society leads to the growth and popularity of traditional ingredients from plants and herbs, nutraceuticals, complimentary, and alternative therapy for lowering blood glucose in diabetes patients.^{11,12}

Green tea as complimentary alternative therapy for diabetes

In this issue, there is one clinical research written by Lahirin, et al¹³ from Department of Nutrition Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia, about green tea (*Camellia sinensis*), one of the most popular herbs studied worldwide, which give blood glucose lowering effect in healthy subjects. Green tea is a well-known beverages in Asian countries such as Japan, Korea, and China which has been spread to become famous beverages all over the world.¹⁴ For Indonesian society, green tea usually consumed at breakfast or coffee/tea break in the afternoon.

Now, green tea is not only famous because of its delicious taste, which is suitable for most tea lovers, but also for its beneficial for maintaining several metabolism process in our body.¹⁴

From clinical trials, green tea consumption is associated with reduction of cardiovascular risks, such as diabetes, hypertension, dyslipidemia, and obesity. Green tea consumption is also in line with reduction of markers of inflammation, oxidative stress, and free radicals. These trials were done in several eastern countries like Taiwan, Japan, and Korea. Overall, almost all trials support the consumption of green tea.¹⁴ It is also known that its effect correlate positively with doses of green tea in one day (calculate with cups). In meta-analysis done by Peng, et al¹⁵ it is suggested that green tea consumption had a favorable effect on decrease of blood pressure. Although this meta-analysis only prove a little reduction on blood pressure (± 2 mmHg), but samples from 13 clinical trials included in this meta-analysis and significance of the statistical calculation speak 'the big beneficial effect' for green tea lovers. Unfortunately, meta-analysis about green tea consumption and the effect of weight reduction not achieve statistically and clinically. Although Baladia, et al¹⁶ found decrease in the percentage of fat mass, it is not clinically relevant.

There is a meta-analysis which correlates green tea consumption and blood glucose management published in 2014. Unfortunately, this analysis did not show any statistical and clinical relevancy from green tea consumption on fasting plasma glucose, fasting serum insulin, OGTT-2 h glucose, HbA1c, and HOMA-IR in populations at risk of type 2 diabetes.¹⁷ As the effect of green tea in vitro molecularly has been known, Wang, et al¹⁷ suggested other high quality clinical trials for definitely determine the effect of green tea on glycemic control in population at risk of type 2 diabetes. It is also needed clinical trials that perform in patient with type 2 diabetes.

Lahirin, et al¹³ finding in this research revealed a beneficial effect of postprandial glucose in high dose consumption of green tea. Although it is not a new strike, Lahirin strengthen the dose-effect relationship of green tea consumption and blood glucose management. Despite it is not applicative to consume many cups of green tea in one day, Lahirin finding can reinforce other pharmacy

research: which dose is most suitable for blood glucose lowering. In the future, it is not impossible that green tea extract can be a phytopharmacy or supplement, along with conventional oral hypoglycemic agents, to manage blood glucose in patient at risk of diabetes, prediabetes (impaired glucose tolerance), and diabetes.

Suggestions for clinicians and researchers

We are now in the era of commercialization. Everything can be look beneficial and important to be consumed as long as packaged and marketed flawlessly. Abundant of researches in the field of complimentary alternative medicine from small group of patients to meta-analysis using plants and herbs for many purposes must drive our critical thinking of many aspects. First, is it applicative in daily practice to consume a lot of plants or herbs which have beneficial effect for our body? What doses is the most ideal for us to get the beneficial effect? Second, is the evidence clinically significant or just statistical game that bring the positive effect of the herbs? Third, what parameters used in monitoring of the beneficial effect? Is it applicable and clinically relevant to examine it in daily practice? These principals of appraisal must be deeply held by all clinicians before suggesting any plants or herbs for the treatment of specific disease.

But, as a part of academics society, we must also support and reinforce research which is using plants and herbs in manage specific disease, commonly metabolic or degenerative diseases such as hypertension, diabetes, dyslipidemia, obesity, and metabolic syndrome. Give the best evidence with the best ethical manner. The result can help building evidences related to the topics. Last but not least, always honestly report the result although it is a negative result.

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Correspondence author: **Laurentius A. Pramono**, L_aswin@hotmail.com