

Effective Dosage of the Extract of *Ganoderma lucidum* in the Treatment of Various Ailments

Teow Sun Soo

Department of Microbiology & Biochemistry, School of Applied Sciences, MARA Institute of Technology, 40450 Shah Alam, Selangor, Malaysia

ABSTRACT: Although *Ganoderma lucidum* possesses efficacious medicinal value, its extract may still be considered as a nutraceutical. However, it is important to know what dosage of the extract works best for different ailments if it is intended to afford a cure or to alleviate certain sicknesses. Unlike drugs, its toxic dose, lethal dose as well as effective dose have yet to be exactly determined. The usual dosage given is generally based on personal experience with patients suffering from different illnesses. Its effective dose varies from ailment to ailment, ranging from 1.5 to 9 g per day. Usually a higher dose is prescribed for patients suffering from more serious illnesses like cancer, whilst a course of treatment may last for 2 weeks to 3 months.

1 INTRODUCTION

Ganoderma lucidum, or Reishi, as it is more commonly known in the West, or Lingzhi, used more often in the East, was acclaimed as an elixir of life (that it could augment good health and general well-being) in the Orient some two thousand years ago. Recent research has revealed its active ingredients which include polysaccharides, triterpenoids, organic germanium, adenosine, LZ-8 and an array of amino acids besides numerous mineral types. The polysaccharides of *G. lucidum* serve as immunopotentiators in the treatment of cancer (Ito *et al.* 1977, Kishida *et al.* 1988). The organic germanium promotes the circulatory system as well as the metabolism of the body by providing more oxygen (Mizono *et al.* 1988). Adenosine of *G. lucidum* suppresses platelet aggregation, thereby preventing thrombosis and heart attack (Shimizu *et al.* 1985). Different fractions of triterpenoids present are responsible for different functions.

Ganoderans A, B, and C possess remarkable hypoglycemic actions (Hikino *et al.* 1985, Tomoda *et al.* 1986). Ganoderic acids, T, S and R and ganosterone act as a liver function stimulant and protectant against hepatitis and hepato-necrosis (Liu *et al.* 1988, Hirotsu *et al.* 1986). Ganoderic acids B, Mf and ganodermic acid T-O are hypocholesterolemic (Lin *et al.* 1988, Komoda *et al.* 1989) whereas ganoderic acids B, D, F, H, K, S and Y alleviate hypertension (Morigiwa *et al.* 1986). LZ-8, an immunomodulating protein, possessing mitogenic activity *in vitro* and immunomodulating activity *in vivo*, regulates immune response and inhibits anaphylaxis (Kino *et al.* 1989). As many as twenty amino acids are present in *G. lucidum* and eight of these are essential amino acids.

Even though *G. lucidum* possesses medicinal value, its extract may still be considered as a nutraceutical and is classified as nutritional or food supplement by certain authorities and that it should not be registered as a drug. To date, there is no standard formulation pertaining to its dosage especially when it is prescribed in medicinal therapy. On top of that, different pharmaceutical dosage forms are available. It may be in the form of syrup, tonic, pill, tablet, capsule and even aqueous extract for injection. Various species and strains of *Ganoderma* are used in the preparation, and besides the basidiocarp (fruit body) and mycelium, its spores are also used in treatment.

Various hospitals in China made use of 5 to 60 ml of syrup containing 10 to 20% of *Ganoderma* fruit body or mycelium 1 to 3 times daily for the treatment of chronic bronchitis, cardiovascular disorders, neurasthenia, hepatitis, hypercholesterolemia, hypertension, insomnia and leucopenia. Chang (1994) postulated that the minimal mean effective dose to be as low as 300 mg extending to 30 g or more as the dose range but stressed that the efficacy could be achieved at 1 to 5 g because of the logarithmic nature of the dose-response. This report summarizes the effective dosages used in the treatment of various ailments.

2 MATERIALS AND METHODS

2.1 *Ganoderma lucidum* extract

Ganoderma lucidum extract, manufactured by Ganoderma Nutraceuticals (GN) through a solvent extraction process from *Ganoderma lucidum* fruit body cultivated by the company, is a natural product. The dosage form of the extract is in 500 mg capsule.

2.2 Clinical conditions of patients

Patients from all age groups, male and female, having the following complaints were taken for the studies: migraine and headache, 18 patients; rheumatism, 20 patients; gout, 24 patients; hypertensive, 18 patients; hypotensive, 12 patients; asthma, 28 patients; dengue fever, 8 patients; diabetes mellitus, 32 patients; neurasthenia, 22 patients; skin allergies, 16 patients; kidney problems/haemodialysis, 12 patients; insomnia, 28 patients; hypercholesterolemia, 18 patients; constipation, 21 patients; haemorrhoids, 31 patients; dysmenorrhoea, 29 patients; cardiovascular problems/angina pectoris/palpitation, 27 patients; lupus erythematosus, 9 patients; hepatitis A, B, and C, 19 patients; epilepsy, 5 patients; gastritis and gastric ulcer, 17 patients; stress, 12 patients, and cancer including leukemia, 48 patients.

3 RESULTS

3.1 Health maintenance

The usual dose is 1 to 2 capsules 3 times daily. Once the desired effect has been reached, usually after 1 to 2 weeks, the daily dose can generally be reduced to 2 to 3 capsules. The extract of *Ganoderma lucidum* could be effective in treating a variety of clinical conditions. The experiences gained during the last 6 years of treating and assessing of this product in such a wide array of patient situations as below.

3.2 Migraine and headache

The extract has been shown to be effective in completely curing these ailments. It is believed that oxygen shortage in the brain (hypoxia) is at the core of the pathogenesis of a migraine attack. Once a certain threshold of oxygen deprivation is reached, the migraine attack occurs. The usual dose is 3 capsule 3 times a day (tds) before meals.

3.3 Rheumatism and gout

As an anti-inflammatory agent, the extract is effective in substantially alleviating the problems and pain related to rheumatism or osteo-arthritis and gout. The patients should see significant effects within 1 week. The dosage is 3 capsule 3 times daily, before meals.

3.4 *Hypertensive or hypotensive*

In treating hypertension or hypotension the extract has been shown to be highly effective in a very large number of cases treated. In the more successful cases the blood pressure is back to normal within 2 months and in some cases within 2 weeks. The recommended dosage is 1 capsule 3 times daily for 5 days, increasing to 2 capsules 3 times daily for 1 week and then to 3 capsules 3 times daily. It is very important that the patient with hypertension starts with only 1 capsule as a higher dose might increase the blood pressure of the patient. Positive results should be obtained within 30 days. Once the desired fall in blood pressure has been achieved, the daily dose can generally be reduced. For maintenance therapy, 2 capsules 2 times daily are usually sufficient.

3.5 *Asthma*

The extract has been found effective in reducing and, in some cases eliminating asthmatic attacks. The recommended dosage begins with 1 capsule 3 times daily for 5 days, increasing to 2 capsules 3 times a day for 1 week and then to 3 capsules 3 times daily. It is important that the patient starts with a low dose as a higher dose might initially trigger an asthma attack.

3.6 *Dengue fever*

The extract has been found to be effective in increasing the platelets of the peripheral blood and is potentially useful in treatment of Dengue fever. The recommended dose is 4 capsules 3 times daily for a month.

3.7 *Diabetes mellitus*

The extract is effective in reducing blood sugar level and the amounts of insulin required for diabetic patients. The effectiveness of the treatment is reduced the longer the length of time that the patient has been a diabetic. For non-insulin dependent patients it is possible to have a better cure. Patients should see significant effects within 1 to 2 months. The usual dose recommended is 3 or 4 capsules 3 times daily depending on the severity of the condition.

3.8 *Neurasthenia*

The extract is effective in regaining stamina and energy or debility due to prolonged illness especially for cancer patients after undergoing radio

and/or chemotherapy. They are able to eat and sleep well. The dosage is 2 capsules 3 times daily.

3.9 *Skin allergies*

The extract is effective in clearing up a large variety of skin allergic conditions either due to food or aerogens. The dosage prescribed is 3 capsules 3 times daily.

3.10 *Kidney problems/hemodialysis*

Ganoderma extract has been found to be useful in detoxifying the kidney and improving its overall function. Patients receiving hemodialysis should find that the duration and frequency of the treatment could be reduced. The usual dosage is 3 or 4 capsules 3 times daily depending on the severity of the condition for as long as required.

3.11 *Insomnia*

The extract has been shown to be effective in completely curing this condition in a very large number of cases treated within 1 month. The usual dose is 3 capsules 3 times daily.

3.12 *Hypercholesterolemia*

The extract has been found to be effective as a hypocholesterolemic agent. The usual dosage is 4 capsules 3 times daily. Patients should see results within a month.

3.13 *Constipation*

The extract has been shown to be effective in relieving or eliminating constipation problems. The recommended dosage is 3 capsules 3 times daily. The patients should see results within 1 to 2 weeks.

3.14 *Hemorrhoids*

The extract has been found to be effective in reducing and also curing this condition depending on the severity of the case. Patients should see results with 30 days. The usual dose is 3 or 4 capsules 3 times daily depending on the severity of the condition.

3.15 Dysmenorrhoea

The extract has been shown effective in reducing or eliminating excessive menstrual pain and irregularities. Treatment has to be maintained for 2 or 3 cycles for it to be effective. The usual dosage is 3 capsules 3 times daily. Patient needs to stop taking the capsule during the actual period.

3.16 Cardiovascular problems/angina pectoris/palpitation

Ganoderma extract has been found effective in addressing a variety of cardiovascular problems. It improves on the circulatory system with excess oxygen. It also eliminates the conditions of angina pectoris and palpitation. The recommended dosage is 1 capsule 3 times daily for 5 days, increasing to 2 capsules 3 times daily for 1 week and then to 3 capsules 3 times daily. Patients should start with only 1 capsule per dose as a higher dose might initially increase the blood pressure of the patient.

3.17 Lupus erythematosus

Ganoderma extract has been shown to be very effective in treating this autoimmune disease. Patients should take 3 capsules 3 times daily.

3.18 Hepatitis A, B, C

The extract is highly effective in improving and, in most cases, curing Hepatitis A, B and C within a period of 3 months. The recommended dosage is 4 capsules 3 times daily. Patients should be cured within 3 months.

3.19 Epilepsy

Ganoderma extract is effective in arresting epilepsy. Patients should take 3 capsules 3 times daily and may expect to see results after a week.

3.20 Gastritis and gastric ulcer

Ganoderma extract has also been found effective for both gastritic and gastric ulcer. The usual dosage is 3 capsules 3 times a day, after meals. Patients should see results in 3 to 4 weeks.

3.21 Anti-stress

Ganoderma extract is useful for people leading a hectic life with a heavy schedule. The usual dosage is 2 capsules 3 times daily reducing to 1 capsule 3 times daily for maintenance.

3.22 Cancer

Although the experiences in fighting cancer are more inconsistent, however, the extract has been shown to be effective in regressing tumours. The results depend on the type of cancer and the severity of the condition. It is recommended that it be used in combination with the prescribed therapy. The *Ganoderma* extract can be highly effective in substantially reducing or eliminating the side effects of radio- and chemo-therapies if it is taken before and after the treatments. It can prevent side effects like hair loss, nausea, vomiting, stomatitis, sore throat, loss of appetite and insomnia. The recommended dosage is 6 capsules 3 times daily as long as required.

3.23 Immunopotentiating effects

Patients with impaired immunity have found *Ganoderma* extract beneficial in boosting or modulating their immune system. The usual dosage is 4 capsules 3 times daily. Patients could expect to see results in 1 to 2 months. Patients taking the extract for the first time can be subject to temporary symptoms which are reflective of the efficacy of the nutraceutical in cleansing the body systems. These may include sleepiness, abnormal sweating, thirstiness, loose stool, frequent urination, bloating and possibly some rashes.

4 DISCUSSION

It could be seen that the effective dosage required in order to afford a cure or to alleviate certain sickness which showed symptomatic improvement after treatment ranged between 1.5 to 9 g a day. This effective dosage is in agreement with that of Chang (1994) that 0.5 to 1 g per day be given for health maintenance and 5 to 10 g per day for serious illness such as cancer or AIDS. This dosage range also agrees well with that of Hsu (1985) that a dose of 1.5 to 9 g for general use and that of Liu and Bau (1980) suggesting that 3 to 15 g a day be administered depending on the severity of illness. A larger dose of 9 g per day was prescribed for cancer

patients. This dosage also conforms with that of Morishige (1988) that 10 g of an aqueous extract be given to cancer patients. Incidentally, the slight difference in doses may not bring about any great variation in their effectiveness and since the toxic dose and lethal dose of *G. lucidum* for humans are believed to be quite high, it could be well tolerated. Of primary importance is the source of *G. lucidum*, whether it is cultivated or from the wild, the strain and species used, the stage of maturation and the method of extraction of the product. If all products used are standardized then it will facilitate to help define the optimal dosage.

REFERENCES

- Chang, R. 1994. Effective dose of *Ganoderma* in humans. Proc. contributed symposia 59A,B. 5th International Mycological Congress. (P.K. Buchanan, R.S. Hseu, and J.M. Moncalvo, eds.), pp. 117-121.
- Hikino, H., C. Konno, Y. Mirin, and T. Hayashi. 1985. Isolation of hypoglycemic activity of ganoderans A and B glucans of *Ganoderma lucidum* fruit bodies. *Planta Medica* 4:339-340.
- Hirotsani, M., C. Ino, C. Furuya, and M. Shiro. 1986. Ganoderic acids T, S and R, new triterpenoids from the cultured mycelia of *Ganoderma lucidum*. *Chem. Pharm. Bull.* 34:2282-2285.
- Hsu, H.Y. 1985. *Oriental Materia Medica*. Long Beach, California. pp. 640-641.
- Ito, H., S. Naruse, and K. Shimura. 1977. Studies of antitumor activity of basidiomycete polysaccharides: VII. Antitumor effect of the polysaccharide preparation from *G. lucidum* on mouse sarcoma 180. *Mie Med. J.* 26:147-152.
- Kino, K., A. Yamashita, K. Yamaoka, J. Watanabe, S. Tanaka, K. Ko, K. Shimizu and H. Tsunoo. 1989. Isolation and characterization of a new immunomodulating protein. Lingzhi8 from *Ganoderma lucidum*. *J. Biol. Chem.* 264:472-478.
- Kishida, E., R. Okuda, Y. Sone and A. Misaki. 1988. Fractionation, structures, and antitumor activities of the polysaccharides of Reishi, the fruiting body of *Ganoderma lucidum*. *Osaka-Shiritsu Daigaku Seikatsukagakubu Kiyo* 35:1-10.
- Komoda, Y., M. Shimizu, Y. Sonoda, and Y. Sato. 1989. Ganoderic acids and its derivatives as cholesterol synthesis inhibitors. *Chem. Pharm. Bull.* 37:531-533.
- Lin, L. J., M. S. Shiao and S. F. Yeh. 1988. Triterpenes from *Ganoderma lucidum*. *Phytochemistry* 27:2269-2271.
- Liu, K. C., S. F. Phounsavan, R. L. Huang, C. Liao, S. Y. Hsu, and K. J. Wang. 1988. Pharmacological and liver function studies on the mycelium of *Ganoderma lucidum*. *Chinese Pharmaceutical J.* 40:21-29.
- Liu, B., and Y. S. Bau. 1980. *Fungi Pharmacopoeia (Sinica)*. Sinoko Co., Oakland, California. pp.170-172.
- Mizuno, T., S. Ohtahara, and J. X. Li. 1988. Mineral composition and germanium content of several medicinal mushrooms. *Bull. Fac. Agric. Shizuoka Univ.* 38:37-46.
- Morigiwa, A., K. Kitabatake, Y. Fujimoto, and N. Ikekawa. 1986. Angiotensin converting enzyme-inhibiting triterpenes from *Ganoderma lucidum*. *Chem. Pharm. Bull.* 34:3025-3028.

- Morishige, F. 1988. *Becoming healthy with Reishi*. III. *Kampo Iyaku Shimbun*. Toyo-Igaku Sha Co. Ltd. Tokyo, pp. 12-20.
- Shimizu, A., T. Yano, Y. Saito, and Y. Inada. 1985. Isolation of an inhibitor of platelet aggregation from a fungus, *Ganoderma lucidum*. *Chem. Pharm. Bull.* 33:3012-3015.
- Tomoda, M., R. Gonda, Y. Kasahara, and H. Hikino. 1986. Glycan structures of ganoderans B and C hypoglycemia glycans of *Ganoderma lucidum* fruit bodies. *Phytochemistry* 25:2817-2820.

DISCLAIMER — Despite all the possible health benefits that can be obtained from *Ganoderma* Nutraceuticals, it is not intended to replace the recommendations of a Medical Doctor. Patients with specific problems should always consult their physicians.