Tinospora – An Exciting New Discovery for Chronic Immune Suppression

by Kerry Bone

As an herbalist I find that I am always being challenged by my patients to extend my knowledge and to learn about new treatment options. In this context I would like to tell you Mary's story.

Mary was aged 74 when she came for a consultation. She had a diagnosis of myeloblastic anemia which is a very rare condition somewhat related to leukemia. However, in Mary's case both her red and white cell counts and her platelet counts were low and she was being maintained by regular blood transfusions. I treated Mary over a period of eight months mainly to boost her very low white blood cell count, since this was a life-threatening situation. In that time, using herbs such as Astragalus and Withania, her white blood cell count did double from its previous low levels, but this was still well below normal. One time in hospital Mary succumbed to an infection and died.

This tragic event stimulated me to learn more about herbs that might be able to particularly deal with chronic suppressed immunity and be able to boost white cell count. An herb that I came across which shows a lot of promise in this regard is the Ayurvedic herb from the Indian sub-continent known as *Tinospora cordifolia.*

The immune system can be divided into hard immunity and soft immunity, in an analogy to the hardware and software of computers. Hard immunity represents the immune cells and any agent which acts on hard immunity in a favorable way will generally boost white cell count. In contrast, agents which act on soft immunity will influence the way immune cells function, but not affect their numbers. Most immune herbs such as Echinacea, Andrographis and others are in the second category of influencing soft immunity. As I mentioned previously, Astragalus and Withania are key herbs which I found can boost white cell count and influence hard immunity. Tinospora is another herb that can boost hard immunity.

In Ayurvedic medicine Tinospora is regarded as a rasayana herb. This literally means the "path that the rasa takes". I will explain what rasa means in a minute but one ancient Ayurvedic text said of such herbs: "One obtains longevity, regains youth, gets a sharp memory and intellect and freedom from diseases, gets a lustrous complexion and strength of a horse."[1] In Ayurvedic medicine rasayana herbs are divided into two categories, those having general rasayana properties which are said to strengthen the whole body and the specific rasayanas which are used to strengthen specific tissues or organs.

Coming to the concept of rasa, health in Ayurveda is based on the triad of the dosha (humors), dhatu (tissues) and mala (metabolic end-products of these tissues). These components must be in an equilibrium for a state of positive health. Seven types of dhatus or tissues are described and arranged in an hierarchical fashion. The rasadhatu, which has been likened to the blood, is the most important. It is the primordial tissue and is formed by the assimilation of nutrients from the diet. All the other tissues receive nutrients via the rasadhatu. Substances that improve the quality of the rasadhatu, and thereby the entire body, are the rasayanas.

Tinospora has been called amrita in Sanskrit which means ambrosia, the nectar of the gods. It is often given as a single entity rather than in combination and is widely used in India as a household medicine to fend off infections. As well as being a general rasayana, it does have some specific properties and is said to have a particular affinity for the liver.

The plant itself is a creeper which is found throughout India commonly in deciduous and dry forests. The stems are mainly used, which when cut transversely show a wheel-like appearance. Traditional uses of *Tinospora cordifolia* include dyspepsia, anorexia and liver disorders (which are probably related to its bitter properties), dysentery and worms.[2] Uses related to its classification as a rasayana include chronic infections, diabetes, gout, anemia, inflammatory arthritis, emaciation, allergies, skin disease and urinary tract disorder.[2,3] This is a very broad range of uses, but such a broad range of uses is typical of the rasayanas because of their attributes in treating the very essence of health and well-being.

The active phytochemicals in Tinospora are not yet very well understood and there is little research to relate these compounds, which include ecdysones, lignans and diterpenes, to the observed pharmacological and clinical properties of Tinospora.

In India, Tinospora has been well-studied in models of depleted immunity and chronic infection. For example, in a mixed abdominal infection model, mortality was significantly reduced by Tinospora from 85% to 33% and when Tinospora was combined with antibiotics mortality fell further to 17% compared to 33% for antibiotics alone. White blood cells were dramatically increased by the Tinospora treatment.[4]

In an infection model involving the induction of peritonitis, Tinospora reduced mortality from 100% to 27%,[5] and produced similar survival rates to the antibiotic gentamicin.[6] It did this without exerting any significant antimicrobial effect[6] and one explanation for this is the observation that Tinospora significantly increased killing of bacteria by white blood cells. From this result it appears that as well as acting on hard immunity, ie boosting white cell counts, Tinospora also favorably acts on soft immunity.

In several models of immunosuppression, Tinospora gave favorable results. For example, in immunosuppression induced by the antirejection drug cyclophosphamide, Tinospora reduced mortality from various infections.[7,8] It countered the drop in total white cell count and neutrophils caused by the drug and in treatment of *Candida albicans* showed an additive effect with an antifungal drug.[8] Tinospora has also boosted immune function in models of stress-induced immunosuppression.[9,10]

Further studies have supported the proposition that Tinospora boosts white cell killing function.[6,11,12] Indeed, the whole adaptogenic or stress alleviating activity of Tinospora (adaptogenic activity is a modern concept which has many similarities to the Ayurvedic concept of rasayana) could be reliant on its influence on one particular class of white cells known as macrophages. Macrophages are white cells involved in the early aspects of immune defence. They assist the recognition of invading organisms by the immune system and also act as frontline killers of these invading organisms by engulfing them, a process known as phagocytosis, and killing them.

In one experiment when macrophage activity was blocked, the beneficial effects of Tinospora in countering the negative effects of stress were lost.[8] This does suggest that macrophages are key cells in the expression of the adaptogenic effects of Tinospora.

Clinical Studies

Many people in India suffer from serious diseases and cannot afford the level of medical care which is available in more affluent countries, hence clinical experiments have been conducted with Tinospora which probably would not be allowed in countries such as the US because of the ethical consideration of denying patients more aggressive options.

Addition of Tinospora to routine surgical procedures in obstructive jaundice decreased mortality from 62% to 25%. In another group where surgery was not performed, Tinospora reduced mortality from 57% to 14%. All patients were also treated with antibiotics.[13] In a double-blind, placebo-controlled trial in obstructive jaundice undertaken in 30 patients, Tinospora reduced mortality from 39%, which was the number for conventional therapy alone, to 6%.[14]

In a double-blind, placebo-controlled trial in 50 patients with tuberculosis, 23 were given Tinospora and 27 were given placebo. All patients received the usual anti-TB treatments. Clinical outcomes measured included symptoms, X-ray results and sputum examination. After two months of treatment 75% of the Tinospora group showed improvement compared to just 40% in placebo. This difference was statistically significant at $p<0.05$. Tinospora reduced the side effects of the drugs from 40% to 15%. However, after six months there was no difference between the two groups indicating that there had been sufficient time for the antibiotics to work well in both groups.[8] Nonetheless, the initial immediate benefits observed for the Tinospora group again suggest a favorable effect on immune function.

In cirrhosis of the liver, depression of the macrophage cells which reside in the liver (these are known as Kupffer cells) is a well-known feature. The effect of six months of treatment with Tinospora on the course of mild to moderate cirrhosis was evaluated in a single-blind, placebo-controlled trial in 12 patients. Treatment with Tinospora significantly improved Kupffer cell function and enhanced phagocytic and killing activity of white cells.[15]

The effect of Tinospora was studied on eliminating the virus in asymptomatic carriers of hepatitis B. This trial was placebo-controlled in 24 carriers. Loss of hepatitis B antigen was 37% in the Tinospora group compared to only 11% for the placebo group.[16]

A randomized, double-blind, placebo-controlled trial was conducted in 38 women with breast cancer undergoing chemotherapy. The number of patients with white blood cell counts after the chemotherapy of less than 3.0 were less in the Tinospora group (55% versus 70% for placebo). Also four patients in the placebo group had white blood cell counts below 0.5 compared to only one for Tinospora.[8] The author of this study considered the effects of Tinospora were modest so the dose may need to be increased.

There is one more clinical study, the results were only released late last year at a conference in Zurich.[17] This was an open controlled study conducted in Europe on 39 women with mild, moderate and severe cervical dysplasia. It included 11 women with severe dysplasia (stage 3) who had refused surgery. Dosages of Tinospora were quite high, 12 to 24 g/day of the whole powdered stem for three weeks with a break of one week for menstruation. Treatment period was 3 to 15 months depending on results. The levels of regression for mild and moderate dysplasia were substantially higher in the women taking Tinospora. While there was no difference in regression in the severe dysplasia group compared to the controls, progression

and invasion of the cancer were down with Tinospora. Three women (8%) experienced a temporary hepatitis which went when the Tinospora was discontinued.

So coming back to Mary, would Tinospora have helped her? We will never know. However, cases such as hers illustrate that we should never be content with the knowledge we have. We need to continue to seek out new knowledge about herbs. I believe that Tinospora will be an exciting and powerful addition to our knowledge of herbs here in the west, just as it has always been a central part of Ayurvedic medicine.

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