Study Of Guduchi Kwath (Tinospora Cordifolia) In Patients of Dengue Fever with Thrombocytopenia

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Abstract

As a result of the remarkable phytoconstituents found in plants, they have been included into conventional medical practise. Several components, including terpenes, glycosides, alkaloids, flavonoids, and steroids, give the herb Tinospora cordifolia (Guduchi/Giloy pharmacological actions and therapeutic characteristics. This is the primary reason why the name is written "Amrita" in certain older textbooks. It's a member of the Menispermaceae family. Fever, urinary issues, diarrhoea, skin problems, leprosy, diabetes, and a host of others can all be treated with this versatile plant. Most recent research confirms its pharmacological significance as an antioxidant, antimicrobial, antibacterial, antifungal, anti-diabetic, anti-stress, hypolipidaemic, hepatic problem, anticancer, anti-HIV potential, anti-osteoporotic, wound healing, and immunomodulatory agent. According to Hindu mythology, it is both the "nectar of immortality" and the "heavenly elixir" that protects the body from a wide range of ailments. Research into the many possible pharmacological effects of this plant medicine has recently accelerated. The plant has an unusual form and numerous coiled branches, and it spreads widely before it dies.

Keyword

Guduchi , Kwath , Dengue , Thrombocytopenia, Tinospora Cordifolia

Introduction

In the early 20th century, when antibiotics and analgesics were not widely available, herbal medicine was the primary treatment system. Herbal medicine increasingly lost favour as its users shifted toward the more

convenient and effective allopathic medical system.

One of the plants described in the Aagryasangraha by Acharya charaka and Acharya Vaghbhata is giloy (Tinospora cordifolia). T. cordifolia, a member of the Menispermaceae family, is a miracle plant. In Ayurveda, it is called Guduchi sattva; in folk medicine, it is called Giloya; and it goes by a variety of other names. There are more than a hundred different herbs that go into making "soma," also called "heavenly elixir" (meal for immortals, referenced in Rigveda), therefore this plant has a double reputation. T. cordifolia has been given the nickname "nectar of life" due to the positive effects it has on the body's immune system and the balance of the body's numerous organs. [1] In the tropics of India, the Andaman Islands, and China, you'll find T. cordifolia, a big, glabrous, deciduous climbing shrub. The stem has a fibrous structure, and its cross-section reveals yellowish wood composed of bundles of wedge-shaped wood having big vessels that are oriented radially and divided by narrow medullary rays. The stem is covered in rosette-shaped lenticels, and the bark ranges in colour from creamy white to a greyish hue. There is a cordate shape to the leaves, and they are made of a thin, waterproof membrane. Flowers are tiny, unisexual, and yellow; they bloom in an axillary raceme that is 2-9 cm long on leaflet branches. Male flowers typically bloom in clusters, whereas female blossoms stand alone. There is a bend to the seeds. The fruits are juicy and single seeded. Fruits mature in the fall and blossoms in the summer. [2]

Fig. 1 Guduchi

Herbal therapy, such as giloy (Tinospora cordifolia), dates back centuries. Among the Menispermaceae family of plants, the common names Amrita and Guduchi are among the most well-known. It has been used to cure a wide range of medical conditions, including fever, urinary issue, diarrhoea, skin illness, leprosy, diabetes, and more, earning it a place among the most important medicinal herbs in the Indian system of medicine (ISM).

Ayurvedic Pharmacology (Dravya Guna-Karma) of T. cordifolia (Guduchi)

Based on biophysical, experiential, inferential, and intuitive mechanisms, Ayurvedic pharmacology is the study of natural medicines used in Ayurvedic medicine. To explain how a substance works, we can look at its five mechanisms of action, or its qualities, which are as follows: rasa (taste perception of the

substance by the chemical receptors on the tongue — Guna (10 pairs of opposite or mirror image attributes; attribute or property of any substance), vipaka (intestinal digestion and tissue metabolism; madhura- neutral, amla- acidic, katu- alkaline), virya (potency; ushna- hot, sheeta- cold), and prabhav (instinct) are all discussed. The six tastes of sweet (madhura), sour (amla), salty (lavana), bitter (tikta) (specific action through specialised receptors). The methods through which drugs exert their effects are entirely biophysical. Actions have consequences, and those consequences are known as karma. This is the drug's ultimate consequence. [3]

Hepatoprotective Activity

HepatoProtective Effects of Tinospora cordifolia water extract (TCE) on Hepatic and Gastrointestinal Toxicity was reported by Sharma et al., a significant increase in the levels of gamma-glutamyl transferase, aspartate transaminase, alanine transaminase, Triglyceride, Cholesterol, HDL and LDL ($P < 0.05$) in alcoholic sample whereas their level get downregulated after TCE intervention, patients showed the normalized liver function of T. cordifolia stand to relieve the symptoms According to the results of one study, T. cordifolia's hepatoprotective properties were demonstrated by the dramatic improvement in clinical and hemato-biochemical markers of CCl4-induced hepatopathy observed in goats given the herb. [4]

The T. cordifolia extract has shown in vitro inactivating ability against Hepatitis B and E surface antigen. Biswadev bishayi et al. indicate that treatment with Tinospora cordifolia extract modulated hepatoprotective and immunostimulatory effects in carbon tetrachloride (CCl4)-intoxicated mature rats. Serum enzyme levels showed that T. cordifolia extract (100 mg/kg for 15 days) protected the livers of CCl4-toxic mice. Serum levels of SGOT, SGPT, ALP, and bilirubin were significantly decreased after CCl4 intoxication in animals treated with T. cordifolia.

Dengue fever

Primarily seen in adults and older children, DF is a secondary infection that often follows the main one. Early signs include high-grade fever that comes in two waves and lasts for three days to a week. Other symptoms include severe headache (mostly retrobulbar), lethargy, myalgia, and aching joints, a metallic taste, loss of appetite, diarrhoea, vomiting, and stomachache. In addition to causing generalised fatigue and muscle and joint discomfort, dengue is also known as breakbone fever. [5] Fifty percent to eighty two percent of DF patients describe a strange rash on their skin. The initial rash, caused by capillary dilatation, manifests as a temporary flushing erythema of the face and usually appears before or during the first two days of a fever. The second rash, asymptomatic maculopapular or morbilliform eruption, appears 3 days to 1 week after the fever subsides. Confluent erythematous patches with pinpoint bleeding spots and rounded islands of sparing (often referred to as "white islands in a sea of crimson") may form when individual lesions converge. Only between 16 and 27% of those who get a rash on their skin actually experience any symptoms. Epistaxis and gingival bleeding, heavy menstruation, petechiae/purpura, and haemorrhage in the gastrointestinal tract

(GIT) are all possible but uncommon manifestations of DF. [6]

Diagnosis

When a patient returns from the tropics or subtropics with a high fever, it is important to rule out dengue fever (DF). [43] Initial abnormalities on laboratory exams include a drop in white blood cells (leukopenia), a decrease in platelet count (thrombocytopenia), and metabolic acidosis. In order to confirm a diagnosis of DF, a microbiology lab test must be performed. The most reliable microbiological techniques involve the separation of viruses in cell cultures, the demonstration of nucleic acids using polymerase chain reaction (PCR), and the serological detection of viral antigens (like NS1) or specific antibodies. [5] While tests that use viral segregation or demonstrate viral nucleic acid can provide an accurate diagnosis, their exorbitant cost makes them unreliable for routine use. [7]

Objectives

- To Prepare guduchi kwath and explain the procedure of its application on dengue fever.
- If any, Side effects of Guduchi kwath will be observed
- To study ayurvedic properties (dravya-guna) of T. cordifolia (Guduchi)
- To study chemical constituents of T. cordifolia (Guduchi)

Research Methodology

An established procedure for investigating a topic by gathering relevant information, analysing it, and drawing conclusions from it is called a research technique. A research methodology is a game plan for doing a study. Research can be roughly described as the systematic gathering and study of facts and information with the goal of advancing knowledge in any field. The study's overarching objective is to employ methodical procedures in order to resolve intellectual and practical issues. Secondary information from from a wide range of published sources was used to write this research. Information used to write this research was culled from a number of different sources on the web.

Result and Discussion

Guduchi and Tikta Rasa

According to Charakacharya, Doshapachan and Shaman should drink Tikta Rasa decoctions. Dravyas with Tikta Rasa are Laghu, clean the Strotas, possess Sheetaveerya, and do the Pachan because these Mahabhutas are very prevalent in Tikta Rasa. These Dravyas aid in the pathophysiology (Samnya Sampraptibhanga) of Jwar thanks to their Agnivardhan property, which they exert on Agnimandhya, Aam, and Pittanubandh (fever). And so, Guduchi, with Tikta and Katu Rasa, executes Agnideepan and Aampachan Dengue haemmorrhagic fever patients can benefit from Guduchi because of the plant's antibacterial, anti-pyretic, immunomodulatory, analgesic, smooth muscle relaxing, antioxidant, cardioprotective, and hypoglycemic properties. [8]

- Guduchi bharad purchased from local Ayurved medical stores.
- The standardization of drug was done in BVDU-COA, Rasashastra Department.
- The authentification of drug was done from recognized institute.

Table 1. Ayurvedic properties (dravya-guna) of T. cordifolia (Guduchi)

Rasa	***Guna***	***Virya***	***Vipaka***	***Prabhava***
Tikta, Kasaya	*Laghu, Guru, Snigdha*	*Ushna*	*Madhura*	*Vishaghna*
Bitter Astringent	Light, Heavy, Unctuous	Hot potency	Neutral	Anti-toxic

The properties, action (pharmacodynamics) and uses (indication) of T. cordifolia are given in Table 1

Rasa refers to the chemical receptors on the tongue that allow us to appreciate the various flavours we encounter, including sweet, sour, salty, bitter, pungent, and astringent. Guna is an attribute or trait of any substance, and it is defined as ten pairs of opposing or mirror-image characteristics. Virya means power; ushna means hot; sheeta means cold; Digestive and metabolic processes in the intestines (Vipaka); madhura = neutral, amla = astringent, katu = alkaline Prabhava, or targeted behaviour by receptor subtype selectivity. [9-10]

Table 2. Chemical constituents of T. cordifolia (Guduchi)

Type of chemical	Active principles	Part in which present
Alkaloids (*Tikta*-Bitter Principle)	Berberine, Palmatine,	Stem
	Tembetarine, Magnofl orine,	Root
	Choline, Tinosporin, Isocolumbin, Palmatine, Tetrahydropalmatine, Magnofl orine	
Glycosides	18-norclerodane glucoside, Furanoid diterpene glucoside, Tinocordiside,	Stem
	Tinocordifolioside,	
	Cordioside, Cordifolioside A, Cordifolioside B,	
	Syringin, Syringin-apiosylglycoside,	
	Palmatosides C, Palmatosides F,	
	Cordifoliside A, Cordiofoliside B,	
	Cordifoliside C, Cordifoliside D, Cordifoliside E	
Diterpenoid lactones	Furanolactone,	Whole plant
	Clerodane derivatives and	
	[(5R,10R)-4R-8R-dihydroxy-2S-3R:15,16-diepoxy-cleroda-13 (16), 14-dieno-17,12S: 18,1S-dilactone] and Tinosporon,	
	Tinosporides, and,	

	Jateorine, Columbin	
Steroids	β -sitosterol, δ-sitosterol, 20 β-	Aerial part
	Hydroxy ecdysone.	Stem
	Ecdysterone, Makisterone A,	
	Giloinsterol.	
Sesquiterpenoid	Tinocordifolin.	Stem
Aliphatic compound	Octacosanol, Heptacosanol,	Whole plant
Miscellaneous	Nonacosan-15-one	Whole plant
	3,(α,4-di hydroxy-3-methoxy-benzyl)-4-(4-	Root
	Compounds hydroxy-3-methoxy-benzyl)-tetrahydrofuran.	Whole plant
	Jatrorrhizine.	
	Tinosporidine, Cordifol, Cordifelone,	
	N-trans-feruloyl tyramine as diacetate,	
	Giloin, Giloinin, Tinosporic acid.	

Methylation analysis, partial hydrolysis, and carboxyl reduction were performed on an isolated arabinogalactan from the dried stems. The polyclonal mitogenic activity of purified polysaccharide against B-cells was independent of macrophages. [11-12] Table 2 provides the whole chemical composition of T. cordifolia.

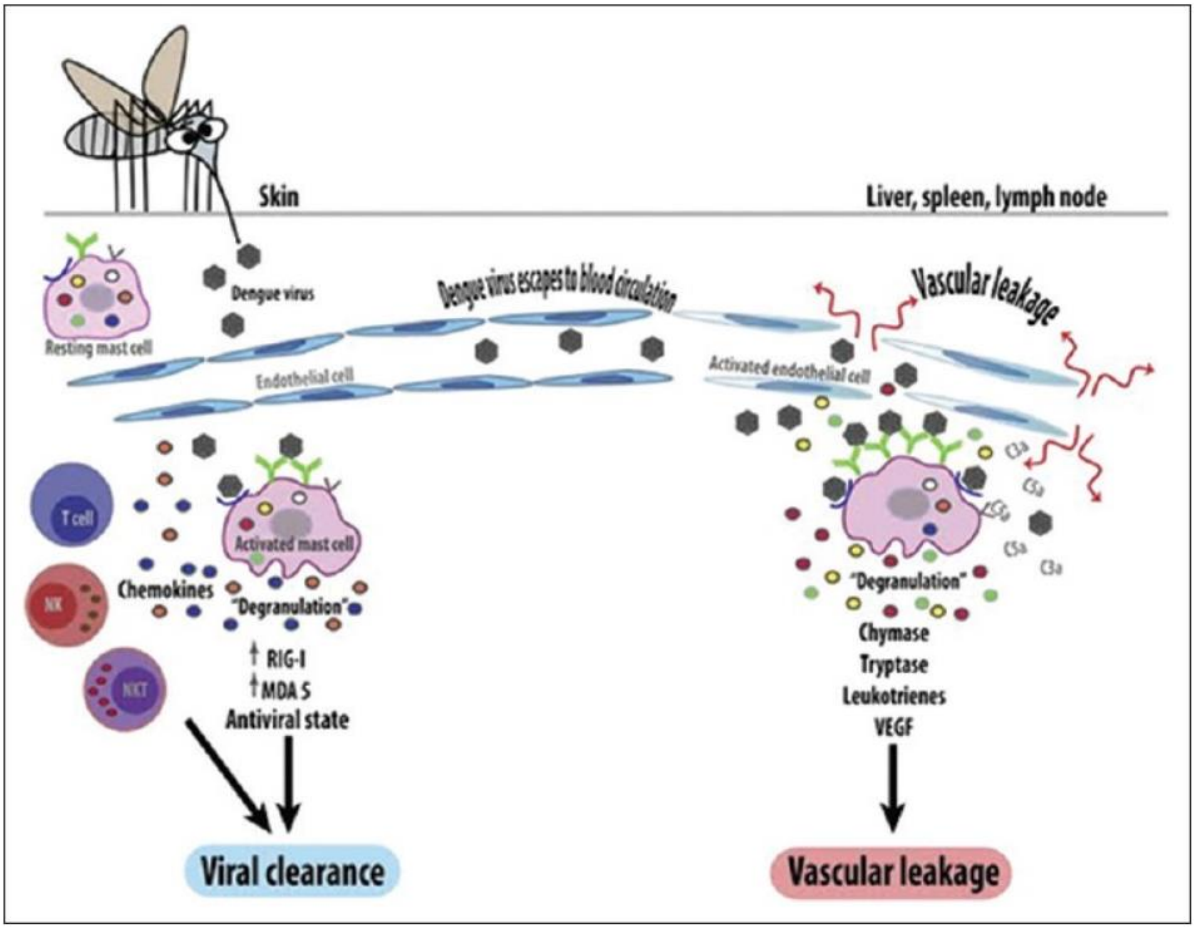

Fig. 2 diagrammatic representation of the pathogenesis of dengue.

From fig. 2 we can see the pathogenesis of dengue. Dengue virus gains entry into the host organism through the skin following an infected mosquito bite. Humoral, cellular, and innate host immune responses are implicated in the progression of the illness and the more severe clinical signs occur following the rapid clearance of the virus from the host organism. Hence, the most severe clinical presentation during the infection course does not correlate with a high viral load.[13] Alterations in endothelial microvascular permeability and thermoregulatory mechanisms lead to an increased loss of protein and plasma. Proposed theories suggest that endothelial cell activation caused by monocytes, T-cells, the complement system, and various inflammatory molecules mediate plasma leakage. Thrombocytopenia may be related to alterations in megakaryocytopoiesis, manifested by infection of human hematopoietic cells and compromised progenitor cell growth. This may cause platelet dysfunction, damage, or depletion, leading to significant hemorrhages.[14],[15]

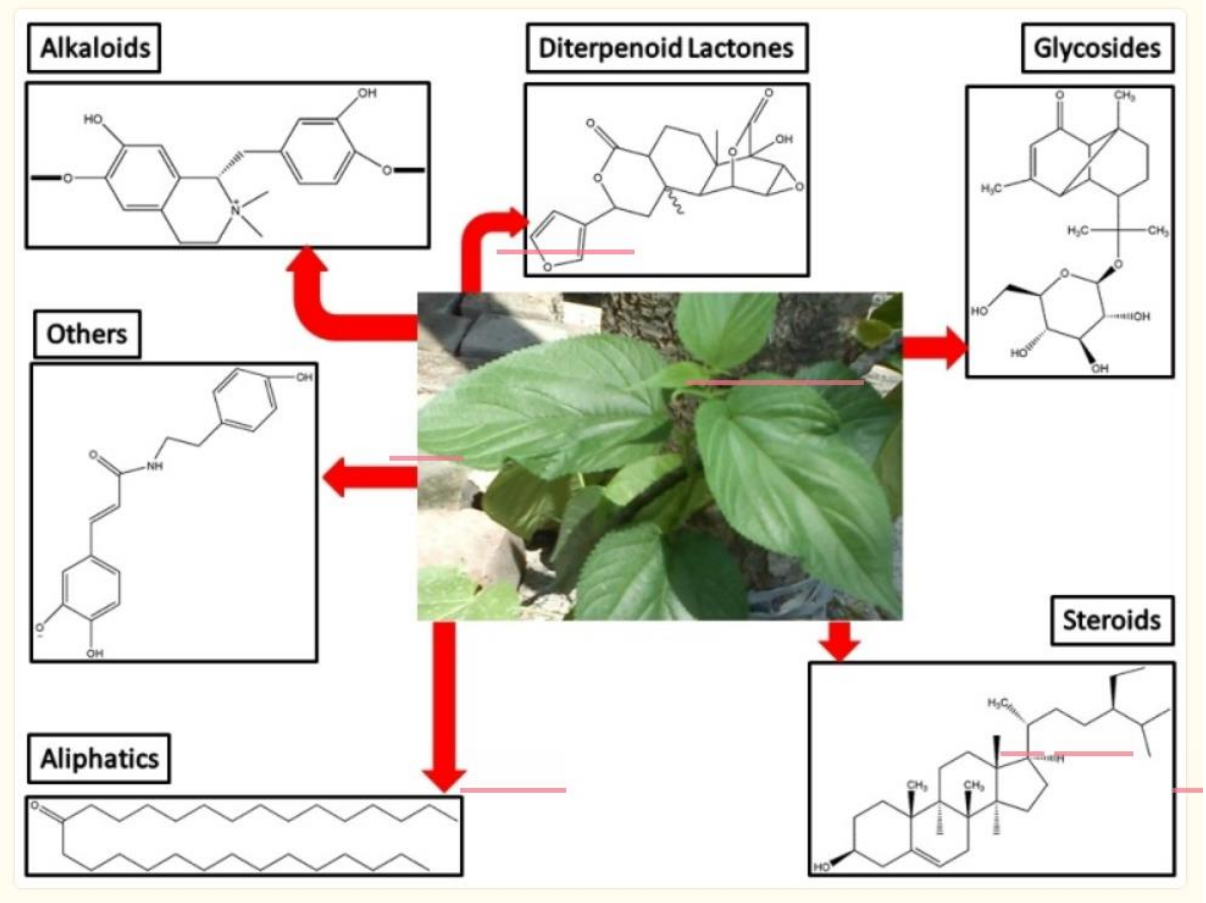

Fig. 3 Active compounds from Tinospora cordifolia

Alkaloids, diterpenoid lactones, glycosides, steroids, sesquiterpenoid, phenolics, aliphatic chemicals, and polysaccharides are only few of the many physiologically active substances that have been isolated from various plant tissues. [16] Different biological roles for these chemicals in illness situations have been reported, opening up avenues for their possible use in clinical research. The anti-periodic, anti-spasmodic, anti-microbial, anti-osteoporotic, anti-inflammatory, anti-

arthritic, anti-allergic, and anti-diabetic qualities of Tinospora cordifolia extracts have led to its widespread use in a wide variety of herbal remedies for the treatment of many disorders. [17]

Conclusion

The ayurvedic plant Tinospora cordifolia has numerous health benefits for humans. It is classified as a climbing shrub, which is part of the family Menispermaceae and native to India, China, and maybe other Asian countries, as well as Australia, Africa, and other regions of the world. Tinospora cordifolia is also known as Guduchi, Amrita, and Giloy. It's not just one component of the plant that has pharmacological benefits for people, but the whole thing. Terpenoids, alkaloids, steroids, lignans, flavonoids, and glycosides are all present in Tinospora cordifolia. Numerous pharmacological properties have been attributed to it, including those of immunomodulation, anti-diabetic, antifungal, in hepatotoxicity (hepatic problem), anti-cancer, anti-HIV potential, antitoxic, and in Parkinson's disease. A variety of the plant's attributes and functions will be covered in this review article. The platelet count increased after taking 40 millilitres of fresh Guduchi Kwath morning and night for dengue hemorrhagic fever. In milder situations, this can be used alone. Reduces the ambient temperature. Facilitates reduction of maculopapular rash symptoms. Performs antihistamine and antiallergic duties. There has been zero evidence of any negative reaction to Guduchi Kwath. The Ayurvedic books' claims of Tinospora cordifolia's pharmacological effects have been corroborated by a remarkable collection of current evidence, demonstrating the drug's enormous promise in contemporary pharmacology.

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