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CLINICAL STUDY OF TRUNA PANCHAMOOLA AND TRIPHALA IN COMBINATION FOR HRUDAY ROGA

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ABSTRACT

triphala is categorized as rejuvenator and traditionally been used in various gastric disorders including intestinal inflammation. the drug effects were assessed by studying macroscopic gross injury and stomach tissue biochemical parameters. *triphala* unequal formulation and chinnodbhavadi kwath showed significant antiulcer activity and this is evident from reduction of ulcer index, lipid peroxidation and hydroxyl radical levels and concomitantly raised levels of catalase and superoxide dismutase. though similar kind of activity was observed in *triphala* equal formulation the magnitude was much less.in the present experiment we are discussing regarding the of truna panchamoola and triphala in combination for hruday roga

Keywords: *Panchamoola, Hrudaya Roga*

INTRODUCTION

HERBAL REMEDIES REPRESENT some of the most ancient medicines in healthcare and are historically considered among the most powerful means of maintaining human health and homeostasis. Ayurveda, a Sanskrit word meaning the knowledge of life or the science of perfect health, is the traditional system of personalized medicine from India, which emphasizes disease prevention and health promotion. *Triphala* (Sanskrit; tri = three and phala = fruits) is a well-recognized and revered polyherbal medicine consisting of dried fruits of the three plant species *Emblica officinalis* (Family Euphorbiaceae), *Terminalia bellerica* (Family Combretaceae), *and Terminalia chebula* (Family Combretaceae) that are native to the Indian subcontinent. It is classified as a *tridoshic rasayana* in Ayurvedic medicine as it promotes longevity and rejuvenation in patients of all constitutions and ages.

The formula consists of the fruits *Amalaki* or the Indian Gooseberry, *Bibhitaki*, and *Haritaki* of the three plants generally in equal proportions and has been used in traditional medicine in India for over 1000 years according to the writings of the great physician Charak in a foundational text of Ayurveda called the *Charaka Samhita* as well as in another key text called the *Sushruta Samhita*. According to Charak, taking the *Triphala Rasayana* (*Triphala* with honey and ghee) daily has the potential to make a person live for one hundred years devoid of old age and diseases.[1] The physician Sushrut indicated that the formula is useful for treating ulcers and wounds.[2]

As both Ayurveda and Western medicine agree that health and disease begin in the gut,[1,3] *Triphala* represents an essential foundational formula as it promotes efficient digestion, absorption, elimination, and rejuvenation. Numerous references in well-respected Ayurvedic medical texts make clear that *Triphala* is revered as a multiuse therapeutic and perhaps even panacea historically.[1,2]

Triphala is classified as a tridoshic *rasayana*, meaning that the energetics are appropriate for *Vata*, *Pitta*, and *Kapha* or all types of patients. Charak describes *rasayanas* as having the qualities of supporting strength and immunity.[1] Given these qualities and the tonic energetics, *Triphala* can be considered for use in the very young, the infirmed, and the elderly. Other classical Ayurvedic classifications attributed to the formula are *shukrala*, digestive, mild laxative at normal doses, bowel tonic at low dose, purgative at high doses, carminative, expectorant, antispasmodic, and bronchodilator. In addition, myriad other uses are described both in the Ayurvedic medical

Cardiovascular disease is a leading cause of mortality and morbidity worldwide, and hypercholesteremia is an important risk factor. Animal studies have reported the hypercholesteremic effects of *Triphala*. In one study, *Triphala* reduced the total cholesterol, low-density lipoprotein, very low-density lipoprotein, and free fatty acid levels in rats fed an atherogenic diet for 48 days.[26] Another study in rats fed an atherogenic diet revealed that *Haritaki*, one of the herbs in *Triphala*, induced hypolipidemic effects in the herb-treated group. A reduction in total cholesterol, triglycerides, and total protein and elevation of high-density lipoprotein cholesterol were found in the herb-treated group compared with control group.[27] *Triphala* is a powerful herb to address imbalances in the gastrointestinal tract and cardiovascular system and should be more widely studied in the context of these common diseases.

In diabetic neuropathy, persistent hyperglycemic conditions are responsible for increased autoimmune damage, insufficiency of neurochemical growth factors, and demyelination of autonomic neurons leading to peripheral nerve injury (Addepalli and Suryavanshi, 2018; Vinik et al., 2013). The damage to capillary blood vessels and peripheral nerves leads to the generation of ROS and hypoxic conditions in the highly vascular organs (Boulton et al., 2005; Fang et al., 2004; Pittenger et al., 2003). Activation of the polyol pathway, overburden of oxidative stress, accumulation of glycated hemoglobin, and collagen deposition are considered as major risk factors in diabetic neuropathy leading to nerve injury (Suryavanshi and Kulkarni, 2021).

Triphala churna is a well-known formulation in the traditional system of medicine—Ayurveda. Traditionally, Triphala churna is administered up to 3–6 g daily to treat various ailments in humans (API, 2011). The human equivalent dose for a rat was calculated from the human dose according to body surface area and was

considered as the middle dose (FDA, 2005).

Diabetes is a metabolic disorder caused by either insulin insufficiency or insulin resistance. Dysregulation of insulin release or insulin activity leads to depletion of glucose transport and thereby weight loss and increased plasma glucose levels. The weight loss and rise in blood glucose level were reversed by Triphala treatment.

Peripheral neuropathy is associated with increased perception to vibration and thermal stimulus which further progresses to sensory loss due to neuronal damage. The thermal, mechanical hyperalgesia and mechanical allodynia have been reported in considerable diabetic patients (Obrosova, 2009). The allodynia and hyperalgesia conditions can be attributed to various factors such as impaired neurotrophic support, impaired activities of aldose reductase, COX-2, inflammatory cytokines, inhibition of release of neurotransmitters like Gamma-Aminobutyric Acid (GABA), and depletion of spinal potassium-chloride cotransporters (Obrosova, 2009). Triphala has been traditionally used to relieve pain and other ailments (Baliga et al., 2012; Peterson et al., 2017). The Triphala treatment significantly reduced the thermal and mechanical hyperalgesia and mechanical allodynia in diabetic rats.

The polyol pathway plays an important role in diabetic neuropathy. Persistent hyperglycemia increases polyol flux in the autonomic nerves which in turn accumulate sorbitol and fructose (Finegold et al., 1983). Increased levels of sorbitol and fructose decrease the levels of myoinositol and impair Na+/K + ATPase activity in the nerves which cause axonal degeneration and demyelination of nerve fibers (Greene and Lattimer, 1984; Pittenger et al., 2003; Vinik and Ziegler, 2007). Simultaneously, increased oxidative stress in the nerves activates inflammatory mediators. This results in degeneration of neuronal microvasculature *via* endothelial hyperplasia, vessel wall thickening, and capillary closure due to collagen deposition (Ewing and Clarke, 1986). Degeneration of nerves affects the nerve conduction velocities. The Triphala treatment increased the nerve conduction velocity to a significant extent.

Chronic hyperglycemic conditions predominantly increase secretion of cytokines such as TNF-α and IL1-β which in turn causes overexpression of cell adhesion molecules, TGF-β, and other inflammatory markers. These mediators mediate the remodeling or accumulation of extracellular matrix and axonal degeneration (Ristikj-Stomnaroska et al., 2019). Inhibition of inflammatory cytokines can inhibit neuronal degeneration. The Triphala churna has been reported for its anti-inflammatory effect *via* inhibition of TGF-β1, TNF-α, and IL-1β (Kalaiselvan and Rasool, 2016). The inhibition of the inflammatory cascade may provide neuroprotection by reducing leukocytic

infiltration, and demyelination of neurons. Hence, in the present study, the effect of Triphala churna on TGF-β1, TNF-α, and IL-1β was evaluated. Triphala treated animals showed a significant reduction in inflammatory cytokines indicating neuroprotection.

Oxidative stress plays a central role in neuronal degeneration by activating inflammatory cascade, extracellular modulation, and increased lipid peroxidation (Bhatt and Addepalli, 2012; Suryavanshi and Kulkarni, 2017). Alteration of antioxidant enzymes such as catalase, glutathione, and superoxide dismutase precipitates mitochondrial dysfunction and demyelination of neurons (Suryavanshi and Kulkarni, 2020). Triphala churna reduced the MDA levels and increased the activity of antioxidant enzymes such as catalase, SOD, and GSH. This eff The edifice of the drug science of Ayurveda stands on a strong foundation of the basic fundamentals of *pancha-mahabhutas* and *tridosa*. The three *doshas*, namely *vata, pitta* and *kapha* are biological representatives for physiological functions in the state of homeostasis and for pathological disorders in the state of imbalance[4]. The vitiation of *pitta dosha* lead to impairment of *agni* resulted in to *amlapitta* (hyperacidity), *grahani roga* (malabsorption syndrome) and other gastrointestinal disorders. Triphala formulation is one of the renowned Ayurvedic formulation used alone or along with other ingredients in Ayurvedic therapeutics for the treatment of gastrointestinal problems. It is categorized as tridoshik rejuvenator and reported to be an antioxidant rich herbal formulation[5,6]. As per Ancient text, one of the *Triphala* formulations called as *Chinnodbhavadi kwath* (decoction) is used for chronic hyperacidity and gastric problems[7]. Pharmacological studies have shown that *Triphala* extract possess antioxidant activity and reduce the damage due to oxidative stress[8]. It has been reported to be cytotoxic to breast cancer cells and prostate cancer cells[9], radio protective[6]and displays antidiabetic and free radicals scavenging activities[10].

The present study was thus aimed to investigate the comparative gastroprotective effects related to Hrudaya roga of *Triphala* formulations in stress-induced gastric ulcer in rats to determine which of the two formulation- *Triphala* equal or *Triphala* unequal is better for the above property and to ascertain whether this property is retained when *Triphala* formulation used as an ingredient of *Chinnodbhavadi kwath* (decoction) to substantiate its traditional claim.

Fruits of *Terminalia chebula* Retz. (Combretaceae), *Terminalia belerica* (Gaertn) Roxb. (Combretaceae) and *Emblica officinalis* Gaertn. (Euphorbiaceae) were collected from forest of Dang and Valsad (Gujarat, India) in the month of December (2005). Stem of *Tinospora cordifolia* (Willd.) Miers. (Menispermaceae), stem bark of *Azadirachta indica* A. Juss. (Meliaceae) and leaves of *Trichosanthes dioica* Roxb. (Cucurbitaceae) were collected from forest of Barda hills, Jamnagar (Gujarat, India) in the month of September and October 2005. The plant materials were authenticated and voucher specimens of each submitted to phamacognosy laboratory of Institute of Postgraduate

Teaching and Research, Gujarat Ayurved University, Jamnagar, India. *Triphala* unequal formulation was prepared by mixing one part of *T. chebula*, two parts of *T. belerica* and four parts of *E. officinalis*[5,11] and *Triphala* equal formulation was prepared by mixing these three ingredients in equal proportion (1:1:1)[12]. *Chinnodbhavadi kwath* (decoction) was prepared by mixing equal proportion of *T. chebula, T. belerica, E. officinalis, T. cordifolia, A. indica* and *T. dioica*. Coarse powder (48 g) of mixture and 768 g water was added; boiled on low to medium heat till the liquid portion was reduced to 1/8th of the original volume (96 g) and filtered[11]. All chemicals used in the study and for biochemical assay were of analytical grade.

Triphala formulations and their ingredients were standardized using gallic acid as a marker compound by HPTLC finger print. The plate was developed in toluene:ethyl acetate:formic acid (5:5:1) solvent system. Gallic acid was observed at 0.52 Rf value, when scanned at 254 nm. *E. officinalis, T. belerica, T. chebula* and all three *Triphala* formulations shows almost the same Rf values as observed for gallic acid (fig. 1). The concentration of trace heavy metals such as lead, cadmium, arsenic and mercury present in formulations were analyzed by Atomic Absorption Spectrophotometer. The data obtained indicated that trace metals do not seem to be present in significant quantities in *Triphala* equal, *Triphala* unequal formulations and *Chinnodbhavadi kwath*.

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