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A REVIEW ON THE ROLE OF PHYTOMEDICINES IN THE TREATMENT OF MIGRAINE

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ABSTRACT

Many Phytomedicine are effective for migraine sufferers, both as acute treatment and for prevention, particularly when coupled with the identification and elimination of migraine triggers. The natural products discussed here include Zingiber officinale (ginger) for migraine treatment and Cannabis sativa (cannabis), intranasal Capsicum annuum (cayenne), and Lavandula stoechas (Spanish lavender) volatile oil for treatment and prevention. Migraine is a common disabling condition mostly in adult population and shows female predominance. Unilateral throbbing type moderate to severe intensity headache is a common manifestation of the migraine though it may present with varied presentation.

KEYWORDS: Phytomedicine, Migraine, Migraine management, severe intensity headache.

INTRODUCTION

The department of chemistry dealing with the chemical processes associated with plant life and the chemical compounds produced by plants phytochemistry is in the strict sense of the word the study of phytochemicals phytochemistry can be considered sub-fields of Botany or Chemistry. Activities can be led in botanical gardens or in the wild with the aid of Ethnobotany mainly applies to the quality control of Chinese medicine, Aromatic Plants (Indian traditional medicine) or herbal medicine of various chemical components, such as saponins, alkaloids, volatile oils, flavonoids and anthraquinones. In the development of rapid and reproducible analytical techniques, the combination of HPLC with different detectors,

such as diode array detector (DAD), refractive index detector (RID), evaporative light scattering detector (ELSD) and mass spectrometric detector (MSD), has been widely developed.[4]

A phytomedicine may be defined as a medicine derived from plants in their original state and standardized for use in a dosage regimen. It encompasses much of what the populations most affected would encounter in terms of plant-remedies from traditional healers. There is some documentation on a wide range of plants used in sub-Saharan Africa to treat ailments, but there has been little in the way of systematic appraisal of their benefits in randomized controlled trials.[6,7]

PHYTOCHEMICALS- BIOLOGICAL BACKGROUND

All plants produce chemical compounds as part of their normal metabolic activities. These include primary metabolites, such as sugars and fats, found in all plants, and secondary metabolites found in a smaller range of plants, some useful ones found only in a particular genus or species. It is the secondary metabolites and pigments that can have therapeutic actions in humans and which can be refined to produce drugs. These plant based drugs are efficient to work as phytomedicine in the human body. Plants up regulate and down regulate their biochemical paths in response to the local mix of herbivores, pollinators and microorganisms (Baldwin, 2002). The chemical profile of a single plant may vary over time as it reacts to changing conditions. Plants synthesize a bewildering variety of phytochemicals but most are derivatives of a few biochemical motifs. Some of the phytochemicals that can be useful as plant based drugs are discussed.[5]

ALKALOIDS

Alkaloids contain a ring with nitrogen. Many alkaloids have dramatic effects on the central nervous system. Caffeine is an alkaloid that provides a mild lift but the alkaloids in Datura cause severe intoxication and even death. Some of the alkaloids are hyoscyamine (Datura stramonium), atropine (present in Atropa belladonna, Deadly nightshade), cocaine (present in Erythroxylon coca, the Coca plant), codeine and morphine (present in Papaver somniferum, the opium poppy), tetrodotoxin (a microbial product in Fugu and some salamanders), vincristine and vinblastine.[5]

- **PHENOLS**

Phenols are a class of chemical compounds consisting of a hydroxyl group (-OH) bonded directly to an aromatic hydrocarbon group. The simplest of the class is phenol (C6H5OH). The anthocyanins that give grapes their purple color, the isoflavones, the phytoestrogens from soy and the tannins that give tea its astringency are phenolics.

- **TERPENOIDS**

Terpenoids are built up from terpene building blocks. Each terpene consists of two paired isoprene. The names monoterpenes, sesquiterpenes, diterpenes and triterpenes are based on the number of isoprene units. The fragrance of rose and lavender is due to monoterpenes. The carotenoids produce the reds, yellows and oranges of pumpkin, corn and tomatoes.

MIGRAINE

Migraine is a common chronic headache disorder characterized by recurrent attacks lasting 24 hours, which are of moderate or severe intensity with regular physical activity, and accompanied by nausea, photophobia or phonophobia. It is the most frequent cause of headache in children and teenagers. The study of migraine in the pediatric population is critical because of its burden on children varying phenotype and possible differential diagnosis.[1,2]

The pathophysiology of migraine is complex and has many implication in terms of how herbal remedies work. The process of migraine headache begins in large part in the blood vessels of the meninges, particularly dural arteries, as well as the meninges themselves. In fact, so far experimentally, the only way to induce migraine is via viva- like stimulation of the diurnal vasculature .While vasodilation of these vessels was long believed to be the key initiating event for migraine headache, it is now clear that this usually does not occur, but instead neurogenic inflammation involving the trigeminal nerve and inhibition of 5-HT1B/1D receptors are the main sources of the problem.[3,4]

Table 1: Summary of phytomedicine treatment for migraine.

Treatment	Acute use	Prophylactic use	Level of evidence
Zingiber officinale (ginger)	X		B
Cannabis sativa (cannabis) female flower	X	X	D
Curcuma longa (turmeric) 1 fish oil		x	B
Capsicum annuum	X	X	A

(cayenne) fruit, capsaicin			
Citrus medica (citron) fruit		X	B
Lippia alba (bushy matgrass) aerial parts		X	B
Tanacetum parthenium (feverfew)		X	C

PHYTOMEDICINE FOR MIGRAINE

○ GINGER

One of the most clinically effective herbs for preventing and treating migraine is Zingiber officinale (ginger) rhizome, from the Zingiberaceae family.[9] It is native to southern and southeastern Asia. It has a long history of use for rheumatic pain, headache, indigestion, and motion sickness, all of which have been confirmed to varying degrees in modern clinical trials.[10] Here, the efficacy, safety, and mechanisms of action of ginger in migraine will be reviewed in more depth. The most recent double-blind clinical trial of ginger for migraine randomized 100 Iranian patients to take either ginger powder 250 mg or sumatriptan 50 mg at the onset of migraine for one month.[11] Other trials using a combination of ginger and feverfew are discussed later, but together this all supports the use of this extremely common, inexpensive, and safe treatment as a first-line treatment for acute migraine headache. Numerous constituents in ginger have been shown to have actions that would explain its beneficial effect in migraine. Zerumbone, a sesquiterpene lactone found in ginger as well as other members of the Zingiberaceae family, has been shown to be an agonist of 5-HT1A/B.[12]

Ginger is a powerful herb that can help in the treatment of migraines. It is often used in Ayurvedic treatments to boost digestive, respiratory, and circulatory functions, but is also known to fight nausea, reduce pain, and detoxify the body. These features also make it useful when dealing with migraine symptoms. Studies suggest that ginger root or powder can reduce the severity and duration of migraines just as effectively as allopathic medications, but with almost no side effects. Researchers believe that these benefits may be linked to the antioxidant and anti-inflammatory properties of ginger. Ginger is also useful as a remedy for migraines because it relieves other symptoms associated with migraines such as nausea and vomiting. Ginger can be used in variety of methods, including in its raw form, fresh juice extract, powder, in herbal teas, or in capsules.[8]

BRAHMI

Brahmi is regarded as one of the most important revitalizing or rasavana herbs in Ayurveda, used in a number of remedies and Ayurvedic medications for over 2,000 years. Mentioned in many of the earliest Ayurvedic treatises such as the Charak Samhita and Sushruta Samhita, brahmi is notable for its beneficial effects on the mind. It has a calming and soothing effect that can lower stress, promote relaxation and sleep, while also exhibiting antispasmodic, anticonvulsant, anti-inflammatory, and analgesic properties. All of these characteristics make it useful in the treatment of migraines and it is a common ingredient Ayurvedic medication for migraine. Brahmi nootropic and neuropharmacological benefits are so powerful, that research shows it can even treat memory impairment. Aside from the use of medications containing brahmi, you can also use brahmi oil and pastes to relive migraines naturally by massaging them onto the scalp or applying the oil into the nostrils.[8]

ASHWAGANDHA

Ashwagandha is one of the most highly regarded rasayana herbs in Ayurved, also finding many mentions in classical texts. Regarded as an adaptogenic herb, Ashwagandha is known to have a powerful revitalizing effect, increasing strength and energy. Its therapeutic benefits extend far wider however, as it is also believed to strengthen brain and nervous system functions. It also has proven anti-inflammatory properties that make it helpful in the natural treatment of migraine. We have also learned through research that the herb can lower stress levels, which can trigger or increase the severity of migraine attacks. You can use ashwagandha suppliments to treat migraines, but the best way to exploit its benefits would be by using Ayurvedic migraine medications that contain the herb.[8]

VITAMIN C

Water-soluble vitamin C is one of the most vital nonenzymatic antioxidants. Since the human organism lacks the enzyme necessary for vitamin C synthesis, i.e., L-glucono-gamma-lactoneoxidase, it needs to be provided with food.[13] Dietary sources of vitamin C are fruits and vegetables.[14] Ascorbic acid (L-ascorbic acid; LAA), being a weak acid, is the active form of vitamin C. This is an unstable organic compound, which is easily decomposed due to temperature, light, the activity of heavy metals, and Ph.[15] Ascorbic acid is involved in, among others, detoxification processes in the human body and neuronal metabolism.[16] The effect of LAA on the redox balance in the human body is twofold: It acts as a reducing agent

and is an enzyme cofactor. At the same time, due to its reducing properties, LAA can reduce metals, such as iron or copper, thus increasing their oxidizing properties.[17]

In 2006, Chayasirisobhon examined the influence of an antioxidant combination product (10 capsules a day) in patients suffering from migraine (with and without aura). In this uncontrolled open-label study, patients received capsules containing 120 mg of pink bark extract, 60 mg of vitamin C, and 30 IU of vitamin E (in each capsule). In patients who completed the treatment period, improvements, including both reduced headache frequency and headache severity, were observed.[17] Chayasirisobhon also conducted an open-label study to examine the effect of vitamin C (150 mg) and *Pinus radiata* bark extract on migraine symptoms. The patients were administered vitamin C and *Pinus* bark in the aforementioned doses for 3 months. After treatment, the patients demonstrated significant improvements: Headache frequency and headache severity were reduced.[18]

○ CURCUMIN

Curcumin is a yellow dye first remoted from turmeric (*Curcuma longa*) in the 19th century by Vogel et Pelletier.[19] Curcumin is the main curcuminoid obtained from turmeric rhizome and is one of the best-known plant polyphenols.[20]

Recently, the use of curcumin in migraine treatment has been increasingly considered by scientists. Bulboacă et al. conducted a study on migraine treatment in which they compared the effect of sumatriptan (ST) administered alone and ST used together with curcumin. The study was conducted using a rat model of migraine induced by nitro-glycerine. Curcumin was administered intravenously in the form of a) alcoholic solution (diluted in saline), and b) liposomes due to reduced gastrointestinal absorption of curcumin.

CONCLUSION

Phytomedicine, in addition to their traditional values, also hold great public and medical interest worldwide as sources of nutraceuticals or novel lead compounds for drug development. The integration of Phytomedicine into the health system should be developed in such a way to bring harmony between the traditional and modern system of health care with minimum threat to each other.

Migraine is common cause of headache, early diagnosis and prompt treatment of migraine enhances the quality of life; prevent conversion of episodic migraine to chronic migraine.

Phytomedicine have been shown to have varying degrees of benefit for preventing or treating migraine. For patients with relatively mild migraines, ginger (most clinically effective), cannabis, intranasal cayenne (best evidence), or Spanish lavender volatile oil could all be considered for initial treatment, particularly by patients who prefer to avoid pharmaceuticals.

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