

ASSESSMENT AND STANDARDIZATION OF HERBAL TREATMENTS FOR RHEUMATOID ARTHRITIS: A COMPREHENSIVE REVIEW

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ABSTRACT

Various pharmacological interventions may be utilized for arthritis treatment when non-pharmacological therapy is insufficient. However, pharmacological therapy can be associated with serious side effects and high costs. Herbal medications have shown the potential for safe and effective management of arthritis. For this review, we attempt to summarize the mechanisms, safety, and efficacy of herbal treatments for OA and RA. After searching electronic databases, we identified nine herbs among 23 clinical trials used for the treatment of OA or RA patients. Improvement of OA and RA symptoms, pain, and inflammation was demonstrated. Though these herbs have shown promise for OA and RA treatment, more studies and clinical trials are required for determining safety and efficacy, bioactivity, and optimal bioavailability. This suggests considerable continuity in the clinical application of these herbs between classical and modern Chinese medicine practice. Of the 15 herbs most frequently used as ingredients of the classical formulas, all have received research attention, and all have been reported to have anti-inflammatory effects. Nevertheless, there remains considerable scope for further research. This text-mining approach was effective in identifying multiple natural product candidates for future research.

Keywords: pharmacological interventions, Ayurveda, Herbal medications, pharmacological therapy, bioactivity, natural product, herbal treatments.

INTRODUCTION

Herbal "renaissances" are taking place all over the world, and more and more people are turning to herbal remedies in place of conventional medicine to cure a variety of maladies. Traditional medical systems

such as Ayurveda employ natural components to balance the body and remove disease's core causes. It incorporates the five components of ayurveda, known as Panchamahabhutas: vayu (air), teja (fire), aap (water), prithvi (earth), and akasha (ether). Pairs of panchamahabhutas are formed. Vata, pitta, and kapha are the three tridoshas (or humours). According to ayurveda, ailments develop as a result of these 3 doshas' faulty functioning. There are 20 kapha ailments, 40 pitta disorders, and 80 vata diseases according to ancient literature. Treatments using Ayurveda are personalized. Nature has endowed us with an exceptionally rich botanical diversity, and several distinct plant species may be seen growing across the nation. Natural gifts for a disease-free and healthy existence for humans include medicinal plants. Today, herbal products are thought to be safer for people and the environment. In India, many medicinal plants' various parts or their extracts are utilized to cure a variety of ailments. Some high activity drug profiles were created by the extraction and characterization of many active phyto-compounds from these green factories. Over time, it has been discovered that medicinal plants may be used to treat and manage a variety of health issues. Researchers' interest in using naturally occurring, physiologically active

molecules with therapeutic potential has grown recently. Mankind fully relied on medicinal plants to heal illnesses before the invention of synthetic medications. Every member of this civilization is aware of the healing properties of plants. Folk remedies were mostly generated from natural product extracts in the nineteenth and preceding centuries, especially those that were obtained from plant species. However, physiologically active organic compounds started to be extracted in reasonably pure form for medical application in the latter half of the nineteenth century. For instance, willow bark was used to create salicylic acid, the precursor of aspirin, in 1874.

LITERATURE REVIEW

Mustafa Tozun (2022) To perform a systematic compilation and meta-analysis of research on the knowledge, attitudes, and opinions of health professionals and students on traditional and complementary medicine (TCM) practices in Turkey. This study is a systematic review and meta-analysis study. The literature review on the subject of the research was carried out between February 25 and March 8, 2022. A search was made on Google Scholar in Turkish and English with appropriate keywords for 2000 and later. The prevalence of the opinion as “TCM should be included in the curriculum of medical and health schools” ranged from 36.7% to 90.4%. The prevalence of the opinion of “It should be applied by evaluating their effectiveness with controlled studies” was between 34.4% and 95.7%. There is increasing interest in TCM and concerns remain due to the lack of evidence-based studies.

Yuan Lin (2022) Curcumin is extracted from the rhizomes of *Curcuma longa* L. It

is now widely used in food processing, cosmetics, dyes, etc. Current researching indicates that curcumin has high medical value, including anti-inflammatory, antioxidant, anti-tumor, anti-apoptotic, anti-fibrosis, immune regulation and other effects, and can be used to treat a variety of diseases. Inflammatory bowel disease (IBD) is a nonspecific inflammatory disease of the intestine including Crohn's disease (CD) and ulcerative colitis (UC). The drug treatment effect is often limited and accompanied by side effects. A large number of basic and clinical studies have shown that curcumin has the effect of treating IBD and also can maintain the remission of IBD.

Supa Pengpid (2021) Lack of information exists about the use of traditional and complementary medicine (TCM) use among middle-aged and older adults in India, which led to studying the estimates of past-12-month Ayurveda/Yoga/Naturopathy/Unani/Siddha/Homeopathy (AYUSH) practitioner and traditional health practitioner (THP) utilization in India. The study included 72,262 individuals (45 years and older) from the cross-sectional 2017–2018 Longitudinal Ageing Study in India (LASI) Wave 1. A moderate prevalence of AYUSH practitioner and THP use among middle-aged and older adults in India was found and several factors associated with AYUSH practitioner and THP uses were identified.

Mahesh Madhav Mathpati (2018) Ayurveda translates as ‘life science’. Its knowledge is not limited to medicine, cure or therapy and is for laypersons, households, communities, as well as for physicians. Throughout its evolutionary history, Ayurveda and Local Health

Traditions have reciprocally influenced each other. In modern times, the influence of biomedicine on Ayurveda is leading to its medicalisation. Over the past century, the introduction and perspective of biomedicine into India has made the human being an object for positive knowledge, a being who can be understood with scientific reason and can be governed and controlled through medical knowledge. This paper explores how this shift towards medicalisation is affecting the knowledge, teaching, and practice of Ayurveda. It examines the impact and contribution of processes like standardisation, professionalisation, biomedicalisation and pharmaceuticalisation on Ayurveda education, knowledge, practice and policies.

Mohammad Bagher Owlia (2016)

Medicinal plants and their secondary metabolites are progressively used in the treatment of diseases as a complementary medicine. Inflammation is a pathologic condition that includes a wide range of diseases such as rheumatic and immune-mediated conditions, diabetes, cardiovascular accident, and etcetera. We introduce some herbs which their anti-inflammatory effects have been evaluated in clinical and experimental studies. Curcuma longa, Zingiber officinale, Rosmarinus officinalis, Borago officinalis, evening primrose, and Devil's claw are some of the introduced medicinal herbs in this review. Since the treatment of inflammation is not a one-dimensional remedy, this review tries to reach a multidimensional therapeutic approach to inflammation with the help of herbal medicine and modification in lifestyle.

Herbal Medicine

The earliest type of medical care that mankind is aware of is herbal medicine, often known as herbalism or botanical medicine. Throughout history, all nations have utilized herbs for their therapeutic or medical properties. An herb is a plant or plant component that is prized for its therapeutic, fragrant, or flavorful properties. The chemical compounds found in herbal plants have medicinal effects on the body. Widely utilized in both developed and developing nations, herbal medicines are complex chemical concoctions made from plants that have a limited therapeutic efficacy due to low oral absorption. Herbal preparations are now widely used as medicinal agents for conditions including diabetes, arthritics, liver illnesses, cough cures, memory boosters, and adoptogens.

Rheumatoid Arthritis

An autoimmune condition called rheumatoid arthritis causes degradation of articular cartilage, synovial proliferation, and joint inflammation. It is a debilitating and painful inflammatory disorder that can cause significant loss of mobility as a result of discomfort and joint damage.

It is a kind of arthritis which causes inflammation in one or more joints in the body. It can cause cartilage degeneration and abnormal joint hardness owing to bone fusing. Depending on the disease's stage, arthritis is a chronic inflammation of the synovial joints that can manifest in a number of ways. In the given below figure it has shown hand with Arthritis.

Clinical Trials Involving Herbal Combinations

There is evidence of synergistic effects when different herbs are combined, including improvement in therapeutic outcomes and safety. Oral supplementation

with *B. serrata*, combined with N-acetyl-D-glucosamine and ginger for 6 months, was found to significantly improve pain-free walking distance and WOMAC signs/symptoms for patients with moderate knee OA in comparison to standard OA management, without safety or tolerability issues. Boswellic acid combined with methylsulfonymethane has been found to improve knee OA pain management and functional recovery and reduce the intake of anti-inflammatory drugs. In a 3-month randomized, placebo-controlled trial comparing the efficacy of curcumin and boswellic acid (Curamin) with curcumin (CuraMed) and placebo, Curamin significantly improved physical performance tests and WOMAC joint pain indices compared to placebo. Moreover, the effect size observed with the curcumin-boswellic complex was greater than that of curcumin alone. Another study examined the effects of a combination of *C. longa* and *B. serrata* (CB).

Other Herbs with Potential for OA and RA Treatment

A few other medicinal plants have been investigated in preclinical studies using cellular and animal models, but have not been tested in clinical trials involving humans. Nevertheless, the mechanisms elucidated by these preclinical trials provide insight into the therapeutic potential of these natural medicines for OA and RA. Species of *Angelica*, *Cinnamon*, *Glycyrrhiza*, and *Saposhnikovia* have been widely used in traditional Chinese medicine and known for their anti-inflammatory and pain-relieving effects. These herbs diminish the expression of inflammatory mediators, such as IL-1, IL-6, TNF- α , PGE2, and COX-2, via modulation of NF- κ B activation and

kinase activity in in vitro and in vivo arthritis models. Furthermore, treatment with these herbs has been found to improve cartilage structure and texture, normalize bone remodeling, and inhibit osteoclastogenesis in animal arthritis models. Such findings suggest the beneficial use of these herbs for treating arthritis in human patients.

RESEARCH METHODOLOGY

A multidisciplinary working group was established composed of health professionals involved in care delivery, technical staff of the SER Research Unit and representatives of patients. All participants are listed in the authorship and collaborations section. Very recently, in 2014, a separate ministry was created under the Union Government of India, which is headed by a minister of state. Understanding the patterns of utilization of AYUSH care has been important for various reasons including an increased focus on its mainstreaming and integration with the biomedicine-based health care system. Complementary and alternative medicine or modalities (CAM) are defined by the National Center for Complementary and Alternative Medicine (NCCAM), National Institutes of Health, as "health care approaches with a history of use or origins outside of mainstream medicine" (NCCAM). Various forms of CAM have been reported for centuries. The quality researches on Ayurveda basics with advanced scientific techniques can expand the knowledge and path of current medical science.

RESULTS

Determination of effective polyherbal combination of medicinal plants

Various combination of ethanol extract of poly herbal (PHF1-PHF5) containing

varying proportion of ethanol extract of the Plant parts Boswellia Serrate gum, Cinnamomum Zeylanicum Bark, Toddalia Asiatica dried root and Curcuma Longa rhizome prepared as per the formula given in Table 1.

Thin Layer Chromatography

The TLC studies of the combined polyherbal fraction containing varying proportion of ethanol extract of the powdered Boswellia Serrate gum, Cinnamomum Zeylanicum Bark, Toddalia Asiatica roots and Curcumin longa rhizome shown in Table 2: Thin layer chromatogram of Polyherbal Fractions (PHF1-PHF5).

Estimation of phytoconstituents in Polyherbal fractions

Total phenolic content and total flavonoid content were estimated in the combined poly herbal fraction using standard procedures. The results were shown in Table 3.

Table 1: Different proportion of ethanol extract of selected plants

Polyherbal Fraction	Boswellia Serrate	Cinnamomum Zeylanicum	Toddalia Asiatica	Curcuma Longa
PHF1	1	1	1	1
PHF2	2	1	1	1
PHF3	1	2	1	1
PHF4	1	1	2	1
PHF5	1	1	1	2

Table 2: Thin layer chromatography of Polyherbal fraction

Poly herb	Solvent I	Solvent I	Solvent I	Solvent I	Solvent V
	I	II	V	V	V

al Fraction	Noof Spots	Rfva lues	Noof spots	Rfva lues	Noof spots	Rfva lues	Noof spots	Rfva lues	Noof spots	Rfva lues
PF1	3	0.20 0.36 0.52	1	0.90	1	0.90	2	0.07 0.81	1	0.09
PF2	2	0.16 0.38	2	0.82 0.90	2	0.14 0.85	2	0.05 0.81	2	0.03 0.94
PF3	2	0.16 0.36	2	0.82 0.88	1	0.85	2	0.06 0.81	2	0.08 0.90
PF4	2	0.16 0.38	1	0.82	2	0.10 0.90	2	0.07 0.81	2	0.07 0.90
PF5	1	0.12	1	0.92	4	0.05 0.25 0.80 0.90	2	0.10 0.81	2	0.09 0.81

Table 3: Total phenolic and flavonoid content of ethanol extract of polyherbal fraction

Polyherbal fraction	Total Phenol Content (%)	Total Flavonoid Content (mgQE)
PHF1	9.13±0.554	0.166
PHF2	16.26±0.554	2.453
PHF3	10.33±0.042	1.232
PHF4	12.52±0.068	1.652

PHF5	8.96±0.554	0.812
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CONCLUSION

Certain herbal medicines may be used as a complementary therapy to work with or reduce the need for pharmacological agents. Treatment with herbal medicines may also offer a safer alternative with equal or superior efficacy. Current pharmacological therapy options recommended for OA and RA are associated with variable efficacy and safety, especially for the treatment of chronic pain and inflammation. Since the beginning of time, religious and ceremonial events have employed the resin of *Boswellia* species as incense. Its medical benefits are very well known, particularly for the treatment of inflammatory illnesses, as well as for the treatment of several cancers, for the healing of wounds, and for its antibacterial activity. Growing emphasis is being placed on using plant-materials as a source of medicines for a wide range of human ailments as a result of rapid population growth, an inadequate supply of branded medications, alarmingly high treatment costs, unfavorable side effects of several allopathic drugs, and an increase in the resistance to current drugs for infectious of the appropriate plant stock, and pervasive exploitative practices by the pharmaceutical industry, a continuous and uninterrupted supply of the source materials is frequently challenging.

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