



MULTICOMPONENT HERBAL THERAPY: A REVIEW

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ABSTRACT

Multicomponent Herbal (MCH) Therapy is quite advantageous in respect of reliance, safety, efficiency and cost as compared to modern allopathic therapy; particularly in the treatment of long term diseases. It involves use of different phytochemicals in a plant extract which act on multiple receptors instead of a single receptor population providing greater effects with least toxicity. The therapy has a strong traditional base and recently numbers of researchers find it a better substitute for modern drugs and surgery. With so many advantages, multicomponent herbal preparations lack proper standardization techniques and novel delivery approach, which also now seems surmountable. This review attempts to discuss the traditional history, current status and future of this strongly emerging therapy along with the improvements it needs.

Keywords: Multicomponent, herbal therapy, MCH.

INTRODUCTION

Rapid advances in pharmaceutical sciences have brought ever-increasing interests in combined therapies for better clinical efficacy and safety, especially in cases of complicated and refractory diseases.¹

The concept of multicomponent therapy is beneficial when the selected agents possess differing mechanisms of action that provide additive or synergistic efficacy. It reduces the required doses of individual agents compared with mono-therapy and limits side effects. It also has lesser treatment failure rate, reduced case-fatality ratios, slower development of resistance, and consequently, less drug development costs.²

Medicinal plants have attracted many scientists as an effective therapy for the treatment of many diseases. This may be due to many reasons like the side effects of conventional medicine, efficiency of plant-derived drugs and growing interest in natural products. Multicomponent Herbal (MCH) Therapy is the result of the growing interest of scientists in medicinal plants. In this therapy, instead of a single phytochemical, extracts of plant parts such as roots or leaves are used. Herbalists think that the different phytochemicals present in many herbs interact enhancing the therapeutic effects of the herb and dilute its toxicity. According to them, herbal synergism cannot be duplicated with synthetic chemicals as phytochemical interactions and trace components may alter the drug response in many ways.

The clinical efficacy of these multicomponent herbal preparations questions the current trend of highly targeted drug molecules that usually target one single receptor population while it has not been shown that a single receptor group plays an important role for the control of symptoms. Recently, these preparations are used effectively in the treatment of many conditions like functional dyspepsia, irritable bowel syndrome etc.³

HISTORY AND DEVELOPMENT

Since ancient days, natural products, including plants, animals and minerals have been the basis of treatment of human diseases. The basis of concept of modern medicine development remains rooted in traditional medicine and therapies.⁴

In different parts of the world like ancient China, Egypt, Africa, America and India, plants had been used for medicinal purposes long before recorded history. Chemical analysis first became available in the early 19th century which started the extraction and modification of herbal ingredients. Later, chemists began making their own version of plant compounds, and over time, the use of herbal medicines declined in favor of drugs.⁵

Before the 20th century medicines relied almost exclusively on multicomponent medicines, obtained from natural sources. In contrast, the modern pharmaceutical industry almost exclusively uses single-ingredient drugs, otherwise known as new chemical entities (NCEs). However, the rate of NCE discovery has slowed down significantly during the last decade. More and more diseases are being treated with combinations of many single-component drugs. These combination therapies are designed to lower the incidence of resistance or target several pathological processes simultaneously. A number of researchers have proposed that multicomponent pharmacological agents that hit multiple targets impact the complex equilibrium of whole cellular networks more favorably than drugs that act on a single target.⁶

They are particularly important in treating infectious diseases such as HIV, tuberculosis, malaria and complex chronic diseases like cancer and metabolic syndrome. Studies have documented the ability of plant secondary metabolites including quercetin, catechins, resveratrol and curcumin to potentiate the activity of various cancer



drugs and/or other phytochemicals. In addition, some plant secondary metabolites have been shown to overcome multiple drug resistance in tumors or in pathogenic bacteria when used in combination with other natural products or antibiotics. In particular, a number of plant extracts and natural products work synergistically with existing antibiotics, restoring antibiotic activity against resistant strains of bacteria such as *Staphylococcus aureus* and *Escherichia coli*.⁷

The use of MCH preparations have accelerated in recent years due to high cost of modern medicine and increased public interest in natural products. Approximately 25% of modern drugs used in the United States have been derived from plants.⁸

RECENT UPSURGE

Due to growing concern over the reliance and safety of drugs and surgery and failure of modern medicine in treating most common health conditions, interest has increased in herbal drug research in India. This inclination is also due to the following reasons –

- Many natural medicines are being shown to produce better results than drugs or surgery without the side effects.⁹
- They have a strong traditional or conceptual base and the potential to be useful as drugs in terms of safety and effectiveness whereas modern medicines have a very strong experimental basis for their use but are potentially toxic.¹⁰
- They can deliver mixtures of multi-functional molecules with potentiating and synergistic effects.
- They are well suited for long-term disease prevention in an era of genetic testing and increased life expectancy.
- They also provide additional vehicles for delivering health and wellness.¹¹

Drug interactions and adverse reactions

According to a study in the Journal of the American Medical Association (JAMA), roughly 15 million adults are at risk of possible adverse interactions between prescription medicines and herbs or high dose vitamins.¹²

Used correctly, multicomponent herbal preparations can help treat a variety of conditions and in some cases may have fewer side effects than some conventional medications. But because they are unregulated, they are often mislabeled and may contain additives and contaminants that are not listed on the label. Some herb components may cause allergic reactions or interact with conventional drugs, and some are toxic if used improperly or at high doses. Some herbal supplements may contain high levels of heavy metals, including lead, mercury, and cadmium which may be injurious to health.¹³

Plants have chemical defense mechanisms against predators that can have adverse or lethal effects on humans. Although not frequent, adverse reactions have been reported for herbs in widespread use. A case of major potassium depletion has been attributed to chronic licorice ingestion. Some herbs may amplify the effects of anticoagulants; certain herbs as well as common fruit interfere with cytochrome P450, an enzyme critical to much drug metabolism.

NEED OF STANDARDIZATION

Herbs contain many compounds of uncertain biological activity, and no firm data exists on the safety, drug interactions, or efficacy of many herbal medicines. These problems can be readily solved by providing a means of appropriately standardizing herbal products to provide a consistent potency per dose, and then conducting clinical and nonclinical tests to ascertain their role in the treatment of various diseases.

It is found that pharmacologically inactive substances can interfere with or enhance the potency of active compounds. A method of standardization should therefore assure consistent content inactive ingredients as well as consistent biological activity. Development of a medically meaningful form of standardization is a two-step process. First, the relevant biological activity of the total extract (treated as a single drug) must be determined. Then there must be rigorous identification of the individual compounds that contribute to the activity. It is important to assay bioactivity of the final product, not just that of individual constituents.¹⁴

All components and their combinations in a herbal multi-component preparation should be ensured for the pharmaceutical prerequisites like characteristic fingerprint chromatograms, defined amounts of marker substances, physicochemical characteristics and microbiological monitoring, etc.⁵

NEED OF NOVEL DRUG DELIVERY SYSTEMS

In India, the drug delivery system used for administering the MCH medicines to the patient is traditional and out-of-date, resulting in reduced efficacy of the drug. This may be due to destruction of drug in highly acidic pH of stomach and first pass effect in liver. Thus, it is important to integrate novel drug delivery system and Indian MCH medicines to combat more serious diseases. In fact, several researchers are working towards developing novel drug delivery systems like mouth dissolving tablets, sustained and extended release formulations, mucoadhesive systems, transdermal dosage forms, microparticles, microcapsules, nanoparticles, implants etc. of herbs. Some of them are at the laboratory stage and some have reached to the market, e.g. Res-Q (the world's first poly-herbal mouth dissolving tablet). But there are many challenges with herbal drugs which need to be overcome like difficulty of conducting clinical research in herbal drugs, development of simple



bioassays for biological standardization, development of pharmacological and toxicological evaluation methods, investigation of their sites of absorption, toxic herbal drugs in use, discovering various animal models for toxicity and safety evaluation, legal and regulatory aspects of herbal drugs and so on.⁹

CONCLUSION

Medicinal plants have been a major source of cure of human diseases since time immemorial. In the present scenario, the demand for MCH products is growing exponentially throughout the world and major pharmaceutical companies are currently conducting extensive research on plant materials for their potential medicinal value. If the Indian herbal industry is to survive in the domestic and international markets, steps have to be taken to establish a good quality control mechanism, for which the government should consider assisting the industry in setting up a well-established unit which shall work towards excellence in standardization of herbal drugs to meet international requirements in the coming years. More so, the industry should stress on upgradation of quality by improvement of agricultural and industrial production of raw materials, preservation, innovate quality control methods, evaluation of therapeutic value of material plants and formulations.

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