

A Review on Herbal Medicine: Past, Present and Future

*Sunny Kumar¹, Bharat Parashar²

¹ Student, IEC School of Pharmacy, IEC University, Baddi (H.P.)

² Dean, IEC School of Pharmacy, IEC University, Baddi (H.P.)

Abstract: Herbal medicine also referred to as herbalism is all about the study of botany and the use of plants intended for medicinal purposes. It involves the integration of different therapeutic experiences and practices based on indigenous systems of medicine that may effects many previous generations, which often leads to its valuable guidelines for the selection, preparation and application of herbal formulation for the disease or disorder treatment, control and management. Now days in this modern era people are bending themselves towards the organic life to stay healthy and also prefer the herbal medicine instead of allopathic. The result of hike in demand for herbal medicine, leads to the safety concern of herbal products regarding the standardization, efficacy, bioavailability, preservation and quality. This safety measure is taken care by the policy-makers, health professionals, manufacturer as well as the consumer. The Improvement in quality of herbal medicine can not only be done by taking care at the time of production or post marketing surveillance but it should be taken care at the time of cultivation too as it the basic step involved in the manufacturing process of the herbal medicine. The implementation of quality check during production as well as cultivation is providing the new strength to herbal medicine in market.

Keywords: Herbalism, consumer, bioavailability, preservation, standardization.

Introduction:

Herbal medicine, also known as botanical medicine or phytomedicine, refers to the use of plant parts such as seeds, berries, roots, leaves, bark or flower for medicinal and therapeutic purposes. ^[1] Herbal medicine are made up of one or more herbs or processed herbs in particular quantities to provide some nutritional benefits or other benefits intend for use to diagnose treat, reduce disease of human beings or animals and evolve the structure or physiology of human beings or animals. ^[2]



Fig. 1: Images of herbs

Herbal medicines are associated with several therapeutic experiences and practices of indigenous systems of medicine, which serve as guidelines for the selection, preparation and application of herbal formulation to achieve therapeutic benefits. India is also known as botanical garden of the world for producing medicinal plant in large quantities. ^[3] Alleviation of diseases and maintenance of good health using herbal medicines is as old as humanity and is the most popular form of healthcare

application known to humanity that has been practiced by all cultures in all ages throughout the history of civilization. ^[4] Herbal medicine has developed throughout the timeline of human civilization. The present commentary briefly described the existence of herbal medicine in pre-historic/ancient times and influence of government policies as well as impact of modern day science and technology in the advancement of herbal medicine, in efforts to achieve the goals of catering for the needs of human health and wellness. In health world medicinal plant have played a major role. In spite of the great advances observed in modern medicine in recent decades, plants still make an important contribution to health care. ^[5]

History:

People globally have been using herbal drugs for the treatment, control and management of variety of diseases since pre-historic times. ^[6,8] The use of plants as medicines predates written human history. Archaeological evidence indicates that humans were using medicinal plants during the Paleolithic, approximately 60,000 years ago. ^[6,7] Other sources also provide ample historical evidence of man's use of plants for medicinal purposes over in antiquity. For example, the Sumerian clay tablet, dated about 5,000 years ago, recorded and described the medicinal uses of plants such as laurel, caraway and thyme by the ancient Sumerian of Mesopotamia. ^[2,7,8] These plants are still used all over the world for medicinal purpose. A Ancient Egyptians used plants such as mandrake for pain relief and garlic for the treatment of heart and circulatory disorders about 3,500 years ago written by Ebers papyrus. ^[7] A source of information about the early use of medicinal plants also Ancient China. In Traditional Chinese Medicine Ephedra is a herb used for more than two

thousand years to cure asthma and other respiratory problems. The active ingredient in ephedra is Ephedrine, is used in the commercial pharmaceuticals preparations for the treatment of asthma symptoms and other respiratory problems.^[9] It helps the patient to breathe more easily.

In India, herbal medicine has used many herbs such as turmeric possibly as early as 4,000 BC. the Rig-Veda, a collection of Hindu sacred verses, carry most characteristic of Vedic science such as yoga, meditation, mantra and Ayurveda, which are yet widely practiced until now.^[10]

Ancient western world traditional medicine systems:

In the ancient western world, the development of western medicine is believed to have been influenced by the writing of Greek philosophers, in particular, Hippocrates (460-377 BC) (Hippocrates also known as Father of Medicines) and Aristotle (384-322 BC), and the works of Dioscorides, who compiled information on more than 600 plant species with medicinal value in his famous book 'De Materia Medica'. This book, which was written in the first century AD, remained the standard reference in most of Europe for more than 1,500 years.^[7,11] Herbal medicine played major role in health care management during the Renaissance (476-1500 AD) and the middle Ages.^[12] In Ancient time the information about herbal remedies were preserved in community house or monasteries in countries such as England, Ireland and Germany where as in country like India the information were provided by person named as Vaidya.^[5] In the meanwhile, Arabs expand the use of their own herbal resources together with those of the Chinese and Indian, which was known to the Greco-Roman world.^[8] European settlers brought the herbal tradition in The United States combine with those receive from native Americans, such time as the early 1900s when growth of the pharmaceutical industries, combine with the development in analytical techniques as well as increased knowledge of synthetic chemistry, led to a decline of herbal medicine practices in the in the developed world.^[5]

Herbal medicine during the 19th and 20th centuries:

Before 19th century, plant medicines were administered in their crude form as infusions (herbal teas), tinctures (alcoholic extracts), decoctions (boiled extracts of roots or stem bark), and syrup or applied externally as ointments (poultices, balms and essential oils) and herbal baths.^[3] After the 19th century, scientists started the method which involves the isolation, purification and identification of bioactive principles from medicinal plants. All this lead to the discovery of some of the most important drugs that are still widely used in modern medicine^[14,15] For example quinine isolated from Cinchona plant species is an effective antimalarial drug, Morphine extracted from opium poppy (*Papaver somniferous*) is a powerful pain reliever.^[13,16]

In the early twentieth century herbal medicine was prime healthcare system as antibiotics or analgesic were not available. herbal medicine gradually lost its popularity among people by increasing use of allopathic system of

medicine, and it was based on the rapid or instant therapeutic action of synthetic drugs. Almost a century has passed and it has witnessed limitation of allopathic system of medicine. In this era the herbal medicine has achieved a tremendous momentum and it is evident from the fact that certain herbal remedies are more effective in comparison to synthetic drugs.^[17]

Present Status of Herbal Medicine:

The herbal medicines or phytomedicines continue to expand rapidly throughout the world. Many people are now resorting to herbal products for the treatment of various health challenges in different national health-care settings. Last decades witnessed a surge in public interest towards natural therapies both in the developed and developing countries.^[18] The sections of the population that still rely on traditional practitioners and herbal medicines for their primary care in developing countries like, Africa up to 90% and India up to 70% of the population. In China, traditional medicine accounts around 40% of overall health care delivered, and more than 90% of general hospitals in China have units for traditional medicine.^[19-21]

At present, herbs are applied for the treatment of chronic and acute disease and various ailments and problems such as cardiovascular disease, prostate problems, depression, and inflammation and to boost the immune system, to name but a few. In Africa, the Africa flower (traditional herbal medicine) has been used for decades to treat wasting symptoms associated with HIV.^[22,23] Now, it is believed that nature contributes about 90% to the new drug molecule. Some of the most effective drug provided by nature are dactinomycin, bleomycin, and doxorubicin, vinblastine, irinotecan, topotecan, etoposide, and paclitaxel (anticancer), mefloquine chloroquine, amodiaquine artemisinin, dihydroartemisinin, artemether, and arteether (antimalarial), metformin and eventually the other biguanide, harunganin, cryptolepine, and maprouneacin (antidiabetic), and calanolide A, cucurmin, phenethyl isocyanate, and phenoxidiol (anti-HIV drugs).^[24,25] India has about 25,000 effective plant-based formulations used traditionally across over 1.5 million practitioners of the traditional medicinal system.. There are 7800 medicinal drug manufacturing units in India that consumes about 2000 tons of herbs annually.^[26] The available data suggest that the traditional medicine has a significant market. Indian herbal market is of nearly 50 billion rupees with 14% annual growth. The worth of exported herbal product is about 1 billion rupees. The demand for medicinal plants is increasing every day, and the WHO has projected that global herbal market will grow up to \$ 5 trillion in 2050 from the current level that is of \$ 62 billion. More than 70% of the global diversity are produced by India and China. The most effective global herbal export market includes EU, USA, Canada, Australia, Singapore, and Japan, while Brazil, Argentina, Mexico, China, and Indonesia are new emerging herbal

market.^[27]

Ongoing issue of Herbal Medicine:

Whereas the direct use of plant extracts in advance countries continued to decline in the late 19th and early 20th centuries, medicinal plants still play major role in health care system of many parts of the world.^[28] Although, the use of herbal supplements has increased rapidly over the past 30 years and most commonly used medicinal plants in the United States have been reviewed.^[29] According to World Health Organization (WHO)^[30] about 60% of the world's population rely on traditional medicine and 80% of the population in advance countries depends almost completely on traditional medicine practices and herbal medicines for their initial health care desire.^[31,32] Moreover, at the starting of the 21st century, the worldwide annual market for herbal medicinal products approached US\$ 60 billion^[29] and the long tradition of herbal medicine continues to the present day in China, Indian and many countries in Africa and South America^[7,28,31,32,33] In marketplaces of some countries, in the village medicinal herbs are sold alongside vegetables and other goods. Practitioners of herb medicines in developed countries usually undergo a difficult and extended training to learn the names, uses, and preparation of native plant.^[34-36]

Recent Advances in Herbal Medicine:

1. Effect of various extracts of *Tectona Grandisilinn* bark on Mast cell degranulation:

Tectona Grandis Linn (Verbenaceae) is an important medical plant commonly known as Sagwan. The bark of this plant is useful in the treatment of Bronchitis^[37,38]

Aim of the present study is to validate traditional asthmatic action of the bark

2. Antimicrobial activity of Hydro-Alcoholic extracts of *Lens culinaris* seeds:

Traditionally medicinal plant has been used for many years as topical and internal preparation in the treatment of fungal and systemic synthetic drugs available in the market but they possess adverse effect like Itching, redness, skin peeling, diarrhea etc.^[39,40]

Thus researches recently pursue their quest to identify new plant with antimicrobial properties. In this continuation the *Lens culinaris* seeds were evaluated for the antimicrobial activity.

3. Anti-hyperglycaemic activity of ethanolic extract of *Swertia chirayata* and *Trigonella Foenum Gracum*:

The main aim of the work was to focus on the Anti-hyperglycaemic activity of *swertia chirayata* leaves and *Trigonella Foenum Gracum* seeds. These two plant are widely used to cure diabetes. The present

study was to evaluate these plants for its Anti-hyperglycaemic activity in normal and alloxan induced diabetes rates at the dose level 20mg/kg.^[40-42]

Conventional medicine agenda for developing Nations:

In order to achieve "health for all", an effective health agenda must ensure that Western medicine is complemented with traditional medicine.^[31,43] Accordingly, African Head of States declared the first ten years of the millennium (2001-2010) as the 'Decade of Traditional Medicine in Africa' that is commemorated on 31st August of every year.^[30,44] This was renewed for the period 2011-2020 and the recent adoption of the Traditional Health Practitioner's Bill by the South African legislature and commemoration of African Traditional Medicine day in Cameroon are testimonies to the fact that African governments are committed to ensuring the integration of traditional medicine into African health care systems.^[33,45] For instance, the WHO in collaboration with the Cameroonian government has put in place a strategic platform for the practice and development of traditional medicine in Cameroon, with a view to harmonizing the traditional medicine practice through the creation of synergy between traditional and modern medicine practices and institutionalization of more harmonized integrated traditional medicine practices by the year 2012.^[33] An effort to create a sustainable teamwork between traditional and modern medicine practices, the WHO is now busy in the establishment of definitive guidelines for scientific methodology of clinical research and the re-appraisal of effectiveness of herbal medicine. Few years ago, the Nigerian Government introduce a national committee on traditional medicine with the expressed desire to raise Nigeria's market share of traditional medicine.^[46] These efforts are further complimented by huge investments in medicinal plant research in China, India, Nigeria, and the United States by the WHO^[35] as well as renewed interest in prospecting for medicinal plants by multinational pharmaceutical companies.

In the developed countries, it has been reported that sufferers of chronic diseases are turning to herbal remedies as alternative to modern synthetic drugs.^[47] This renewed interest in the use of herbal medicine is believed to be motivated by several factors including:

Unsubstantiated concerns to side effects of modern drugs: Although synthetic drugs exhibit quicker efficacy, there are at present, unsubstantiated opinion of higher incidents of adverse reactions following the use modern drugs when compared with herbal remedies.^[48-52]

Comprehensibility and availability of herbal medicament: Herbal medicaments are readily available and accessible for both practitioners and especially patients in remote rural areas.^[47]

High cost of synthetic drugs: Medicinal plants used for remedies are comparatively less expensive when compared with orthodox/synthetic drugs.^[31]

Social factors: From a social perspective, traditional medicine has always been considered as an efficient and acceptable option even when modern health facilities are available. As a result of recent advances in biochemistry, immunology, medical botany and pharmacognosy, research findings have established the descriptive capacity, effectiveness and rationality of herbal medicines.

Efforts on herbal medicine research:

The uses of medicines and dietary supplements derived from plants have increase in recent years. Pharmacologist, microbiologist, biochemist, botanist and natural product chemists are now investigating medicinal plants for phytochemicals and lead compounds that could be developed and use for the treatment of several diseases.^[53,54] As exemplified by the plethora of publications of scientific research papers in many reputable journals. Most of these research exercises cover the areas of bio-analytical methodology, isolation, purification and characterization of the bioactive principles of medicinal plants. Furthermore, research efforts in herbal medicine are now focused on the identification of phytochemicals and elucidation of their molecular structures, and more recently, establishing their mechanism of action and potential toxicological properties. For instance, Tanaka et al.,^[55] employed spectroscopic data to identify five phytosterols, namely, lophenol, 24-methyllophenol, 24-ethyllophenol, cycloartanol, and 24-methylene cycloartanol as the major anti-hyperglycemic phytochemicals in Aloe Vera gel using Type II diabetic BKS.Cg-m (+/+) Lepr(db/J) (db/db) mice.

Based on the result of herbal medicine research over the years, the 21st century has seen a standard shift towards therapeutic standardization of herbal medicines, of which their efficacies have been supported and confirmed by clinical trials.^[46] A potentially far-reaching observation in terms of the safety concerns of consuming certain herbal medicine has been also evaluated and documented using in vitro and in vivo methods.^[50,57]

Challenges concerned with Safety and Efficacy of Herbal Medicine:

Safety concern have been reviewed by the worldwide phytomedicine markets along with their control and regulatory measure over manufacture also corporating with distribution and sale of herbal.^[1,50] That leads to increasing demand for herbal healthcare products and application of traditional medicine, also referred to as complementary and alternative medicine systems, in both advancing and advanced countries, there are serious concerns about the safety, standardization, efficacy, quality, availability and preservation of herbal products by policy-makers, health professionals and the general public. The problems associated with regulation, standardization and quality assurance in the manufacture of herbal medicines are prevalent both in developed and developing countries of the world.^[2,58,59]

Challenges Associated to Quality Control of Herbal Medicines:

The quality of the raw materials used in the production of herbal medicines determines to a large extent the safety and efficacy. The quality of source or raw materials is dependent not only on intrinsic (genetic) factors but also on extrinsic factors such as environmental conditions, good agricultural, and good collection practices for medicinal plants, including plant selection and cultivation. It is the combination of many factors that make it difficult to perform quality controls on the raw materials of herbal medicines.^[60] According to good manufacturing practice (GMP), correct identification of species of medicinal plants, special storage, and special cleaning methods for various materials is important requirements for the quality control of starting materials. The major challenges are in the quality control of finished herbal medicinal products, especially mixture herbal products.^[61] Hence, the general requirements and methods for quality control of finished herbal products remain much more complex than for other pharmaceuticals. To ensure safety and efficacy of herbal medicines, the WHO continues to endorse the institution of quality assurance and control measures such as National Quality Specification and standards for herbal materials, GMP, labeling, and licensing schemes for manufacturing.

Future Prospects:

Future is in the phase of increasing demand and fast-growing market of herbal medicines and other herbal healthcare products, in both developing and developed countries of the world.^[62-71]

Conclusion:

In this scenario, the global acceptance and also use of herbal medicines and related products continue to assume an exponential increase. Issues relating to adverse reactions in recent times are also becoming more vivid, increasing in prevalence, and no longer debatable because of the previous misconception of categorizing herbal medicinal products as "safe" as they are derived from "natural" source. Hence, the regulatory policies on herbal medicines must be standardized and strengthened on a global scale. It is now laid in the shoulders of the regulatory bodies to monitor controlled and quality flow of herbal products and to facilitate their development to clinical trial stages.

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