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HERBAL MEDICINES: AN OVERVIEW

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ABSTRACT :

Herbal medicines play a major role in the normal lifestyle. Use of herbal medicines has increased nowdays compared to allopathic treatment. The number of patients seeking alternate and herbal therapy is growing exponentially. Herbal medicines are based on the synthesis of therapeutic experiences of generations of practicing physicians of indigenous system of medicine for over hundreds of years. Herbal medicines are in great demand these days in the developing world for primary health care not because they are inexpensive but for better cultural acceptability, better compatibility with the human body and minimal side effects.

INTRODUCTION :

The World Health Organisation (WHO, 1991) defines herbal medicines as "finished, labeled, medicinal products that contain active ingredients from aerial (above ground) or underground parts of plants, or other plant materials, or combination thereof, whether in crude state or plant preparations." Mc Caleb and colleagues (2000) define herbs as "plant or plant parts that are used in fresh, dried or extracted form for promoting, maintaining, or restoring health." Bown (1995) writes " botanists describe herb as a small, seed bearing plant with fleshy rather than woody parts" and adds that "herbs are valued for their flavour, fragrance, medicinal and healthful qualities, economic and industrial uses, pesticidal properties and dyes.". Plants are a valuable source of therapeutic agents in the armoury of modern medicine itself. Herbal medicine, also called botanical medicine or phytomedicine, refers to using plants, seeds, berries, roots, leaves, bark, or flowers for medicinal purposes. Herbalism has a long tradition of use outside conventional medicine. It is becoming a mainstream of improvement in analysis and quality control, besides advances in clinical research; thus, it portrays the value of herbal medicine for the treatment and prevention of disease. There are many diseases that are being treated with the help of herbal medicine, for example, allergy, asthma, eczema, premenstrual syndrome, rheumatoid arthritis, fibromyalgia, migraine, menopausal symptoms, chronic fatigue, irritable bowel syndrome, cancer, and many more.

Of the 2, 50,000 higher plant species on earth, more than 80,000 are medicinal in nature. India is one of the world's 12 biodiversity centers with the presence of over 45,000 different plant species. India's diversity is unparalleled because of the existence of 16 different agro-climatic zones, 10 vegetation zones, 25 biotic provinces and 426 biomes (habitats of a particular species). Among those, about 15,000-20,000 plants have good medicinal values. However, only 7,000-7,500 species are used for their medicinal values by traditional communities. In India, drugs of herbal origin have been used in traditional systems of medicines such as Unani and Ayurveda since ancient times. The Ayurvedic system of medicine uses about 700 species, Unani 700, Siddha 600, Amchi 600 and modern medicine around 30 species. These drugs are derived either from the whole plant or from different organs, like leaves, stem, bark, root, flower, seed, etc. Some drugs are prepared from excretory plant product such as gum, resins and latex. Even the Allopathic system of medicine has adopted a number of plant-derived drugs which form an important segment of the modern pharmacopoeia. Some important chemical intermediates required to manufacture the modern drugs are also extracted from plants (Eg. diosgenin, solasodine, and β-ionone). Not only does the plant-based drug provide a stable market worldwide, but plants remain an important source for new drugs

Future Of Herbal Medicine :

Within the next quarter century, the achievements of science and technology will be so great that, when brought to bear upon the mysteries of nature that have long puzzled us, those mysteries will yield their secrets with amazing rapidity. It will be a fascinating and eventful period. We will know not only the causes of disease but also the cure for most. The twenty-first century will continue to serve mankind just as the plant and animal kingdoms have served humanity since the dawn of history. In some countries in Europe, unlike the U.S., herbs were classified as drugs and regulated. The German Commission E, an expert medical panel, actively researched their safety and effectiveness. While still not widely accepted, herbal medicine is being taught more in medical schools and pharmacy schools. More health care providers are learning about the positive and potentially negative effects of using herbal medicines that help to treat health conditions. Some health care providers, including doctors and pharmacists, are trained in herbal medicine. They are helpful in making treatment plans for people to use herbs, conventional drugs, and lifestyle change that promotes health. The number of clients who seek alternate and herbal treatment is increasing exponentially.

Herbal medicines are based on the synthesis of therapeutic experiences of generations of practicing physicians of indigenous system of medicine for over hundreds of years. Herbal medicines are now in great demand in the developing world for primary health care not because they are inexpensive but for better cultural acceptability, better compatibility with the human body and minimal side effects. However, latest research has shown that not all

herbal drugs are safe as severe consequences of some herbal drugs are reported. Most of the herbal products in the current market have not been through the drug approval process to demonstrate their efficacy and safety. Some thousands of years of traditional uses can provide us with valuable guidelines to the selection, preparation, and application of herbal formulations. The same rigorous approach of scientific and clinical validation must be applied to prove the safety and effectiveness of a therapeutically active product in order to be accepted as a viable alternative to modern medicine.

Thus, the importance of medicinal plants from the very dawn of civilization up to the last couple of decades have witnessed a tremendous cumulative, informative and educative volume of researches carried out in the ever expanding field of pharmaceutically significant naturally occurring plant products. Interestingly, a better understanding of the plants as a whole vis-à-vis their important chemical constituents has no doubt broadened and strengthened one's acceptability and overall confidence in their usages amongst the consumers. Therefore, the present bio dynamism of the active principles strategically located in the plant kingdom would certainly provide mankind with an eternal store house of clinically beneficial herbal drugs.

SECONDARY METADOLITES: A LEADING LIGHT IN DRUG RESEARCH :

A few basic metabolic pathways are identical in both plants and animals. The major part of vegetable drugs shows their medicinal activity because of the presence of secondary plant metabolites that is; those not involved in the essential metabolism of the cell. The production of these secondary metabolites is dependent on the fundamental metabolic cycles of the living tissues.

Secondary metabolites are organic compounds not directly involved in normal growth, development, or reproduction of an organism.

In contrast to primary metabolites, a lack of secondary metabolites is not fatal immediately but impairs the survivability, fecundity, or aesthetics of the organism for an extended period of time, or even doesn't have much impact. Secondary metabolites often have a limited distribution within a group of organisms, belonging to only a few species of a certain phylogenetic group. In many cases, secondary metabolites have important functions in the plant defense against herbivory and other interspecies defences. Humans utilize secondary metabolites as medicines, flavouring agents, and drugs for recreation. The fascinating structural array of secondary metabolites synthesized by plants in their natures tiny laboratories have been an excellent source of traditional medicine since time immemorial.

With the onset of the scientific era in early 19th century, quite a few physiologically active alkaloids such as morphine (1806) and codeine (1832) from opium, strychinine (1817) from Strychnos species, atropine (1819) from Hyoscymus species, quinine(1820) from Cinchona species, Colchicine (1920) from Colchicum species and ephedrine (1887) from Ephedra species were isolated. However, because proper identification methods were not available at that time, their structure could only be established nearly a century later. The above pure active principles not only verified the claims about the properties of medicinal plantsbut also functioned and continued to function as useful therapeutic agents. In addition, they provide good models for drug development. Validation of traditional prescription by applying modern scientific knowledge toward obtaining leads for new drug development gained momentum since the number of pure compounds bearing better therapeutic activities continued to augment. If verification of activity of the reported claim by modern pharmacological screening is the first and very important step, the next step of even equal importance consists of the isolation of active principles. This is essentially achieved by a systematic chemical investigation guided by bioassay. The various steps that are involved in such chemical investigation leading to isolation of pure compounds are described below: a. Collection and processing of plant material: the plant to be investigated is collected and properly authenticated. It is dried in shade and pulverised to obtain it in powder form.

b. Extraction: the powder obtained above is extracted with suitable and prudent solvents until it is complete, and the extract obtained is assayed for activity.

c. Isolation of active principles: the active extract is exposed to various kinds of separation techniques such as column chromatography, thin layer chromatography (TLC), High Pressure Liquid Chromatography (HPLC), gel permeation chromatography, paper chromatography and gas liquid chromatography to get active fractions. These fractions are chromatographed repeatedly, monitored by bioassay till pure active compounds are obtained.

d. Characterisation: the compounds are characterized by complex spectral techniques such as ultraviolet spectrophotometry (UV), infrared spectroscopy (IR), Nuclear Magnetic Spectroscopy (NMR), Mass Spectrometry and X-ray crystallography. Besides spectral methods, the physical methods melting point (m.p), boiling point (b.p), optical rotation and chemical methods like degradation, correlation and synthesis are utilized for the establishment of the structure of active compounds.

BIOLOGICAL SCREENING AND ITS IMPORTANCE IN DRUG RESEARCH :

Drug screening procedures are important and necessary in order to estimate the harmful or therapeutic potential of useful drugs. Molecular pharmacological procedures are used nowadays to screen herbal compounds or extracts. The classical method of pharmacological screening involves sequential testing of any new chemical entities (NCEs) or extracts from herbal sources by in vitro and in vivo experiments conducted in lower animals like mice and rats and also in higher animals, if necessary. Most drugs used in therapy nowadays have been found and evaluated with these methods. The pharmacologist and the chemist are very much concerned with drug development; therefore they work jointly in evaluating NCEs and gaining a better understanding of active ingredients. Today a large number of active compounds are obtained from herbals, which are highly valuable in the treatment of diseases like metabolic disorders, endocrinological disorders, cancers etc. The continued accumulation of fundamental knowledge about diseases and technological progress in pharmacology, herbal drug technology, molecular biology, and biotechnology has led to the development of much better animal and laboratory models for many diseases. Therefore, the drug screening process will be highly efficient and may further contribute to reduction in the use of animals for research and preclinical development. The primary purpose of the preclinical development stage for a proposed new drug is to investigate drug efficacy and safety before it would be administered to patients. At this preclinical stage, drugs are tested with different doses in animals and/or in vitro systems.

CONCLUSION :

Herbs have been the main source of medicine throughout human history.
It's no Dark Ages relic but an indicator of the expanding place of herbs in modern, high-tech medicine, since approximately 25-30 percent of the prescription drugs on the market contain chemicals found in plants. About 119 chemical substances derived from 91 plants are in current use in Western medicine. Of these, 74 percent came to our pharmacies as folk remedies. Today researchers study folk or historical uses of plants in search of new drugs for many diseases. So herbal plays a major role in the wellbeing of both human and animal.

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