Review Paper

Natural products pharmacology

Accepted 12th November, 2018

ABSTRACT

As per World Health Organization (WHO), more than seventy percent of the world population trust on Traditional Healers (mainly herbal source) for the health care system. In fact, plants are the oldest friends of humans. They did not only provide food and shelter, but also served humanity to cure different diseases. The traditional medicine, also sometime called herbal or natural medicine, exists in one way or the other in different cultures and civilizations, such as Arab, Babylonian, Chinese, Egyptians, Greco, Japanese (Kampo), Tibbi & Unani (subcontinent) and Western.

Key words: Plants, traditional medicine, drugs.

INTRODUCTION

All examples indicate that the Traditional Medicine show interesting combination of activities and there is a good potential of Medicinal plants not only as a source of new drugs but also their use in the form of Botanicals both in developing countries and the industrialized world. Ethnopharmacology has already played important role in the development of Traditional Medicine and will likely to play more significant role in the years to come. It would not be surprising to see that the use of Botanicals will be gradually accepted in the main stream of Traditional Medicine particularly if its mechanism of novelty comes into practice. A team work amongst Ethno-botanists, Ethnopharmacologists, Phyto-chemists and Medical practitioner is essential for the fruitful outcome on Medicinal plants research. The Ethno-pharmacologists will play more effective role in studying the rationale for the presence of different combinations of activities in individual Medicinal plants as well as in the mixed formulations, while Phytochemist's role will slightly shift towards the identification, isolation and standardization of Botanicals.

Morphine isolated from the Opium poppy (Papaver somniferum) is one of the molecules entered into old medicine and is the humanity's finest painkiller. Only the cancer patients suffering from terminal pain can appreciate the value of Morphine, which remains drug of choice today despite its abuse potential. Absolutely, the isolation of Morphine from crude opium by Serturner in 1806 stimulated so much wide-spread research on the vegetable drugs that Megendie was able to publish a medical formulary in 1821, which contained only pure chemical agents, hence laid the foundation for the use of pure chemicals as the alternative to the Botanicals.

Another very important therapeutic class in which compounds from plant sources have been contributed successfully is Cardiovascular research Digitalis, and the Cardiac glycoside derived from the Foxglove (Digitalis purpurea) is the classic example. They represent a widely used group of clinically effective compounds which produce positive inotropic effect on the failing heart as well as having value in the treatment of atrial fibrillation. As a group, they are unrivalled to date by any synthetic or semi-synthetic substitutes even though they are among the most toxic group of clinically useful drugs and have unique mode of action with selective Cardiotonic activity, without accompanying tachycardia. Reserpine, obtained from the roots of the Indian plant Rauwolfia serpentine, gained the attention of the modern Western world in 1949 by Vakil who described its use in Hypertension; in rapid succession between 1952 and 1958, Reserpine was isolated from Rauwolfia, its structure determined and its total synthesis achieved (Dohadwalla, 1985). The indiscriminate use of Reserpine as an antihypertensive agent and tranquilizer led to reports on depression and Parkinsonism effects. These findings stimulated further investigation and evidence was
found that Reserpine depleted not only the brain serotonin but also norepinephrine and dopamine (Curzon, 1990). This was a major stimulus for continued research on transmitter amine defects in depression and Parkinson’s disease. This in part laid the foundation for the development of many of the modern psychoactive drugs and stimulated a significant interaction between researchers and drug industry.

The adverse effects of Reserpine continued to be revealed through clinical research, interest in the product gradually diminished, particularly when safer antihypertensive drugs were made available, though Reserpine is still used in clinical medicine, particularly in low-income population. Absolutely, there is a revival of interest in its use based on some recent clinical trials, which showed that lower doses of Reserpine (50–100 µg) combined with low doses of Thiazide diuretic and Hydralazine provide highly effective blood pressure lowering regimen along with renal protective effect; relatively free from conventional side-effects and is perhaps the most cost-effective antihypertensive treatment. This development of Reserpine clearly illustrates the fundamental scientific principle that drugs, in addition to being therapeutic agent, become tools for further understanding of disease and hence design of new drugs. Other compounds, which are considered invaluable pharmacological “tools” for evaluating the mode of action of other drugs or investigation of basic physiological function, include Muscarine and Nicotine (pioneer selective agonists for Muscarinic and Nicotinic receptors respectively), Cocaine (Catecholamine uptake inhibitor) and Yohimbine (selective alpha 2 blocker).

Aspirin, an Acetyl salt of Salicylic acid (an active principle from Willow bark), is considered one of the most effective analgesic, antipyretic and anti-inflammatory agents commonly used in modern medicine. With the passage of time, multiple therapeutic uses of Aspirin have emerged, with most prevalent use as antiplatelet / anticoagulant observed at the low dose to prevent further problems in patients who have already suffered from one heart attack. The major antithrombotic drugs used today are all derived from veterinary practice in Canada in the 1920s when cattle were noticed to be developing stomach haemorrhage from eating mouldy hay containing sweet clover (Melilotus officinalis). Freshly-cut hay contains sweet smelling Coumarins, many of which act as anticoagulants. Dicoumarol was the major drug synthesized as a result of these observations.

Quinine from Cinchona bark was used to treat the symptoms of Malaria long before the disease was identified and the raw ingredients of a common or garden aspirin tablet have been a popular painkiller for far longer than we have had access to tablet-making machinery. In the middle of the nineteenth century, at least eighty percent of all medicines were plants derived. Then the revolution came inspired by the development of the Pharmaceutical industry and synthetic drugs dominated, though Traditional medicine has never been out of scene. At present, by observing any Pharmacy in the West, one would find at least twenty five percent plant-derived drugs. Also at present, all Pharmacological classes of drugs including Natural Product prototype (Aspirin, Atropine, Artimesinin, Colchicine, Digoxin, Ephedrine, Morphine, Physostigmine, Pilocarpine, Quinine, Quinidine, Reserpine, Taxol, Tubocurarine, Vinblastine and Vincristine), are a few examples of what Medicinal Plants have offered in the past (Aftab, 1995). Most of these plant-derived drugs were originally discovered through the study of traditional uses and folk information of indigenous people and some of these could not be substituted despite the enormous and recent advancement of synthetic Chemistry.

REFERENCES


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