INTRODUCTION

India is a land of diverse cultures and traditions with rich heritage and lineage influenced by Moguls, Dutch, Portuguese and the British. In accordance with the diversity in ethnicity and culture, the health care system in India is plural, i.e., a dominant biomedical sector (conventional allopathic medicine) and equally predominant Indian system of medicine and homeopathy (ISM&H), the later being existing hundreds of years before the advent of the former.

1.1 DEPARTMENT OF AYUSH, GOVERNMENT OF INDIA

Realizing the contribution of these ancient and holistic systems of medicine, Government of India gave independent identity to ISM&H in Ministry of Health and Family Welfare, by creating a separate department in 1993 and rechristening it as Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) in 2003. The AYUSH department is entrusted to shoulder the responsibility of developing scientific research and education, establishing pharmacopoeial standards, evolving good manufacturing and laboratory practices (GMPs and GLPs), and supplementing State Governments’ efforts to establish AYUSH clinics at allopathic hospitals. Drugs of these medicinal systems are brought into the purview of Drugs and Cosmetics Act, 1940.[1]

With the support of Government of India, the infrastructure under AYUSH sector consists of 1355 hospitals (with 53296 beds in all), 22635 dispensaries, 450 undergraduate colleges with 99 having post graduate
departments, 9493 licensed manufacturing units and 718000 registered practitioners of ISM&H in the country.[1]

1.2 COMPLEMENTARY & ALTERNATIVE MEDICINE (CAM) IN WESTERN COUNTRIES

There is an increase in the use of complementary and alternative systems of medicine (CAM) even among western population,[2] especially in chronic disorders viz., epilepsy, cancer, depression for which conventional medicine offers only partial cure.[3] The National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (NIH) in Bethesda, Maryland, United States of America defined Complementary, Alternative and Integrative medicine. According to NCCAM, Complementary medicine is used together with conventional medicine, eg. using aromatherapy to help lessen a patient’s discomfort following surgery. Alternative medicine is used in place of conventional medicine, eg. Using a special diet or herbal medicine to treat cancer instead of undergoing surgery, radiation, or chemotherapy. Integrative medicine combines treatments from conventional medicine and CAM for which there is evidence of safety and effectiveness.[4]

The major types of CAM are whole medical systems (ayurveda, homeopathy, naturopathy, acupuncture, traditional Chinese medicines, etc.), mind-body medicine (meditation, prayer, mental healing and therapies that use creative outlets such as art, music or dance), biologically-based practices (dietary supplements, herbal products), scientifically unproven therapies (shark cartilage to treat cancer, fish
medicine to treat asthma), manipulative and body-based practices (chiropractic or osteopathic manipulation, massage) and energy medicine (Reiki, Qi gong, therapeutic touch, magnetic fields, etc.).[5]

The use of CAM is burgeoning globally; over 80% of developing countries depend on traditional healing modalities.[6] In developed countries the use of CAM has been in focus in recent years.[7] Use of CAM was found to be related to age, income, education and race.[8-10]

1.3 REASONS FOR GROWING POPULARITY OF CAM THERAPIES

There seems to be four reasons for growing popularity of CAM therapies. Firstly, the patients would like to regain control over their health. Terminally ill patients develop a sense of helplessness and feel that following alternative medical systems would give them a greater sense of involvement in decision making. Secondly, people have faith and believe the role of mind-body relation in treating diseases applied by many of the alternative systems. Thirdly, patients would like to improve the quality of life with less suffering, which is generally not possible with conventional medicine.[11] Lastly with easy and rapid availability of information and technology regarding limits of conventional medicine, people seek a more humane, high touch and low technology.[12]

1.4 OBJECTIVE OF THIS STUDY

The present scenario of growing popularity to alternative medical systems encouraged to take up pharmacological study of some of the drugs from ayurveda, unani and herbs used by folklore.

Ayurveda is an ancient system of medicine of Indian subcontinent. Today in India, Nepal, and Sri Lanka, ayurveda is used by number of
people and is also gaining popularity in the west. The word "Ayurveda" is a tatpurusha compound of the word āyus meaning "life," "life principle," or "long life" and the word veda, which refers to a system of "knowledge." Thus "Ayurveda" roughly translates as "the knowledge of life," "knowledge of a long life" or even "science of life." Ayurveda is concerned with measures to protect "ayus", which includes healthy living along with therapeutic measures that relate to physical, mental, social and spiritual harmony. Ayurveda is also one among the few traditional systems of medicine to contain a sophisticated system of surgery (which is referred to as "salya-chikitsa").[13]

Unani system of medicine (Unanipathy) originated in Greece, based on the principles propounded by Galen, a Greek Practitioner and was called Galenic. After him many Arab and Persian scholars enriched the system and developed Unani-Tibb.[14] Some notable scholars of the science of Arab medicine were: Al Tabbari (838–870AD), Al Razi (Rhazes) (846–930AD), Al Zahrawi (930–1013AD), Ibn Sina (Avicenna) (980–1037AD), Ibn Al Haitham (960–1040AD), Ibn Al Nafees (1213–1288Ad) and Ibn Khaldun (1332–1395AD).[15] Now it has become an integral part of Indian traditional system of medicine.

**Drugs were selected for two chronic central nervous system disorders, namely, epilepsy and depression. The drugs were chosen after consultation with the practitioners of the respective medical systems.**
The drugs chosen for testing their antiepileptic potential against electroshock and chemo convulsions (pentylenetetrazol, strychnine and lithium - pilocarpine) in mice were –

1. Panchagavya Ghrutham (ayurveda)
2. Hab-e-Jund (unani)
3. Cynodon dactylon (herbal drug)

The drugs chosen for testing their antidepressant activity were –

1. Kushmanda Lehyam (ayurveda)
2. Itrifal Kishneezi (unani)
3. Barleria cristata (herbal drug)

1.5 BRIEF OUTLINE OF WORK

All the drugs were subjected to the following tests:

1. Preliminary phytochemical screening for knowing their major chemical constituents.

2. Acute oral toxicity studies using OECD guidelines and AOT425 software for determining their LD$_{50}$ values.

3. Neuropharmacological screening designed by Irwin.

4. Antioxidant activity: As there is growing acceptance for the role of free radicals in chronic neurological, neuropsychological disorders and other diseases and the benefits of drugs with inherent antioxidant activity, addition of antioxidants as adjuvants, or including diet rich in antioxidants along with conventional medicine, the drugs were tested for their antioxidant activity.

5. Antiepileptic activity: The animal models chosen for antiepileptic activity were –
i) Maximum electroshock induced convulsions in mice,

ii) Pentylenetetrazol induced convulsions in mice,

iii) Effect of flumazenil on antiepileptic activity of the drugs in order to investigate the probable involvement of GABA<sub>A</sub>-Benzodiazepine receptors.

iv) Lithium-pilocarpine induced convulsions in mice and

v) Strychnine induced convulsions in mice,

6. Antidepressant activity: The animal models chosen for antidepressant activity were –

i) Despair swim test in mice,

ii) Tail suspension test in mice and

iii) Apomorphine induced hypothermia in mice.

The Institutional Animal Ethics Committee approved the study protocol for all the above (IAEC/SUCP/01/2007, IAEC/SUCP/01/2009, IAEC/SUCP/09/2009).