PSYCHOPHARMACOLOGICAL ACTIVITY;
EVALUATION OF THE EFFECTIVENESS OF NUX-VOMICA, RESERPINE, ANACARDIUM & CHLORPROMAZINE HERBAL MEDICINES

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ABSTRACT... Objective: The purpose of this study was to screen some herbal medicine as psychotropic drugs those has strong modulating effect on brain and behavior. **Material & methods:** Herbal drug Reserpine, Nux- Vomica, Anacardium and Chlorpromazine with a wide range of pharmacological actions. In our present study, we evaluate the effectiveness of these drugs as Psychotropic agents and accessed by biochemical-parameters. Rats (weighing 180-250g) and Mice (22-32g) either sex were used in this study. One group was kept as control for drugs. Mice were kept under room temperature. Tap-water was allowed ad-Libitum. Animals were observed during and after 21 days. A tablet crushed in 10ml of water, 1cc was given. Screening method used was swimming induced-despair. **Results:** Among these, Strychnos Nux-Vomica has strong action on cholinergic system, CNS activity and observed as an antispasmodic. Rauwolfia serpentine is an active alkaloid particularly present in reserpine are used to treat essential hypertension and in certain neuropsychiatry disorders. It has sedative and tranquilizing effects, as it depletes catecholamine from the central nervous system. Keeping in view, the medicinal importance of these herbs, our present study was designed to screen these herbs as for CNS activity on Albino mice and rats.

Key words: Herbal Medicines, Psychotropic drugs, Mice and Rats.

INTRODUCTION

The main differences between Western biomedicine and herbal medicine are on diagnosis and treatment that is biomedicine relies on technology, whereas herbal medicine largely depends on individual skills and practical knowledge & observation of the physician. These are built upon the basis of medical theory and practice, whereas in biomedicine, they are based on laboratory tests and clinical trials. Majority of Pakistani population lives in remote areas of Pakistan often have few options of health care available, and although biomedicines are available and used for major & minor complaints, people often rely on local herbal medicine physicians, in particular for chronic diseases. Many rural physicians therefore deal with all kinds of diseases over a long period of time and are able to gain a great deal of good expertise for treating different chronic diseases. However, herbal medicine treatments are not limited to chronic diseases. In addition over time, different medical traditions have developed in different parts of the country and have their own specialties. In terms of medicinal ingredients, there are also regional differences in the occurrences and identification of plants and materia medica, as well as the prevalence of certain diseases. This gave rise to diverse ways of practices. For herbal medicine practitioners, it is essential to have an opportunity where they can share their experiences and discuss specific diseases. So far, there have been very few international conferences where physicians of herbal medicine can get together and share their knowledge. By organizing specific panels & committees for herbal medicine, it would create opportunities for these discussions to take place. The practitioners who will participate in these panels, will come from different regions of country with their own local medicinal plant and medical heritage, and will get a unique chance to exchange their experiences through their presentations and in discussions. Products based or herbal medicine is one of the major frontiers of research. The apparent simplicity of herbal-product after experimental studies proved to be deceptive. Central nervous system effects have been studied more extensively because of its easy availability and its involvement in many symptoms such as depression catalepsy, convulsions and coma etc. Depression is of the most common public health problem of developing countries[1].

Depression is one of the major nervous system problems in Pakistan. Majority of Pakistani people are hypertensive and most of them have certain neuropsychiatry disorders. Many new structural-analogues are being developed in the management of psychiatric illnesses and effect memory. In our study, the effects of some herbal medicine were observed for

psychopharmacological profile. Chemical investigation of the herbal drugs help us in exploring another use of these herbs / alkaloids and / or better understanding of adverse effects that could be seen by the use of these herbal-products[2].

Nux-Vomica is the dried ripe seed of strychnos nux-vomica Linne belongs to Family-Loganiaceae. Strychnos is the Greek name for a number of poisonous plants. Nux-vomica derived from two Latin words that mean a nut that causes vomiting[3]. Nux-vomica tree is about 12 meters tall, grows in Sri Lanka, India and North Australia[4,5]. The seeds bark and leaves of strychnos nux-vomica contain strychnine, a highly poisonous substance that seriously damages the nervous system[6].

Strychnine in minute doses has a beneficial effect on body, supporting the digestive system and improves urination. In high doses, strychnine is extremely toxic as a CNS stimulant[7]. The alkaloid produces excitation of all parts of the CNS and blocks inhibitory spinal impulses at the postsynaptic level. This results in toxic convulsions. Brucine is less toxic than strychnine and is used commercially as an alcohol denaturant[8].

Rauwolfia-Serpentina is a snake root plant belongs to the Apocynaceae. Rauwolfias are evergreen shrubs and trees. Extracts of rauwolfia-serpentina have been used. Primarily as Ayuvadic medicine for a variety of conditions including snakebite, hypertension, insomnia and insanity[9]. The active constituents of rauwolfia-serpentina are indole alkaloids such as reserpme, rescmnamme, yohimbine, ajmaline and serpentine. In 1940, Indian physician had recognized two distinct properties of rauwolfia, one as a hypotensive effect and other as a sedative effect. They began using the agent for clinical-purpose[10]. After the isolation of reserpine in 1952, it was used to lower high blood-pressure, and its property of producing severe depression as a side-effect also made it useful in psychiatry to use it as a tranquilizer in the control of agitated psychotic-patients[11].

Reserpine produces its antihypertensive effects through depletion of catecholamine (adrenaline and noradrenalin) from peripheral sites. The hypotensive effect is mainly due to a reduction in cardiac output and peripheral resistance. Large doses causes hypothermia and respiratory depression. The cardiovascular effect of reserpine includes hypotension, reduced heart rate and cardiac output. The hypotensive response of the drug is due to impairment of adrenergic-transmission results in increased parasympathomimetic effects including increased gastric acid secretion, G.I hypermotility and miosis[12,13].

Anacardium is the marking nut of the Semecarpus Anacardium, a small tree belonging to the Anacardiaceae. A tincture is prepared from the crushed seeds (marking nut). The anacardium patients suffer from a very peculiar and contradictory state of mind such as laughing at serious matters and serious over trifling things. They also suffer from fixed ideas as their mind and body is separate; they suspect everybody and everything around them. They are also subject to illusions of hearing and smell. Anacardium patients have a peculiar sensation of a hook or a pin on the surface of the body as also a sensation of a plug causing a pressing penetrating pain. These sensations whenever present and in whatever ailment will make it a first rare, remedy[14].

Chlorpromazine is a classical neuroleptic. It acts on particular areas of brain to decrease dopaminergic neuronal firing. It is used as a standard psychotropic[15].

MATERIALS AND METHODS

STUDY ON MICE [PART-A]

Rats (weighing 180-250g) and Mice (22-32g) either sex were used in this study. One group was kept as control for both drugs. Mice were kept under room temperature. Tap-water was allowed ad-Libitum. Following drugs and corresponding doses were used:

Animals

Animals were observed during and after 21 days. A tablet crushed in 10ml of water 1cc was given. Screening methods used were: Head dip, Open field, Home cage activity, Stationary-Rod & Swimming induced-despair.

Table-I. Drugs with dosage

Drug	Dosage
Reserpine	0.06 mg
Nux-vomica	0.07 mg
Anacardium	0.08 mg
Chlorpromazine	100mg / 60kg

Table-II. Table of behavioural pattern of animals (MICE)

Drug	Dosing				
	1	2	3	4	5
Control	-	-	-	-	-
Nux-vomica	0.06	0.06	0.07	0.08	0.09
Reserpine	0.06	0.06	0.07	0.08	0.09
Anacardium	0.06	0.06	0.07	0.08	0.09
Chlorpromazine	0.06	0.06	0.07	0.08	0.09

Table-III. Effect of herbal drug on exploratory activity of mices

	Mean + S.E.				
Treatment	Head Dip	Open Filed	Cage Crossing	Stationary Rod	Swimming Test
Control	70 ± 6.35	205±3.7	108.6±5.84	0.70±0.46	2.4±0.36
Reserpine	*62.2±43.4	197±168.8	102.8±92.4	0.63±0.47	0.95±1.43
Nux-vomica	*39.8±28.8	167.2±160.4	103±90.8	5.2±5	*2.63±1.86
Anacardium	*37.2±28.6	160.4±216.6	86.6±61.8	4.2±4.4	1.77±1.52
Chlorpromazine	39.4±32.4	*207±169.4	90.8±74.8	2.62±1.7	3.06±2.57

*Values are mean ± S.E.M. (n=5) significant differences by student t-test * P<0.05 as compared to control.*

Table-IV. Effect of herbal drug on exploratory activity of rats

	Mean + S.E.		
Treatment	Open Field	Radial Maze	Cage Crossing
Control	80.4±43.3	2.6±5.11	27.8±14.27
Nux-vomica	54.8±50.8	4.6±3.6	40.2±29.8
Reserpine	76.2±130.4	*2.2±1.2	22.6±36.6
Anacardium	70.2±104	1.38±1.46	*43.6±40.6

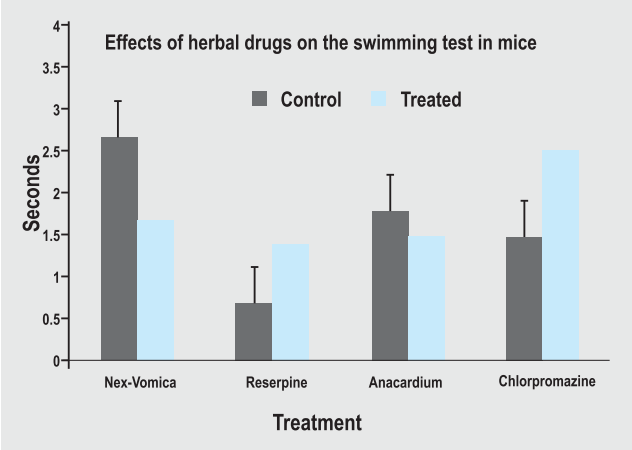
*Values are mean ± S.E.M. (n=5) significant differences by student t-test * P<0.01 as compared to control.*

Table-V. Table of significant and non significant effect of drugs

Drug	Swimming induced despair
Control	↑↑
Nux-vomica	↑↑
Reserpine	No significant effect
Anacardium	↓↓
Chlorpromazine	↑↑

SWIMMING-INDUCED DESPAIR

Physical activity is the most effective way to maintain a healthy body & mind. Evidence is accumulating that exercise has profound benefits for brain function. Activity prevents or delay loss of cognitive function or neurodegenerative diseases. A plastic tank was taken and filled with water. Water filled was such that mice were unable to escape. Six mices were taken. One group was taken as control and the other was taken as the test-animals (mices). Drug was given orally and after 30 minutes of drug-administration, observations were noted



When the control-animal was kept in the water tank, mouse vigorously tries to escape and he continues his struggle for 3 minutes. Then he stops the struggling and floats like a fish. The time during which the mice was struggling is called the struggling- time that was noted. Same procedure was repeated with the test animal.

EFFECT OF HERBAL DRUGS ON EXPLORATORY ACTIVITY

Swimming induced despair

There was no effect on swimming induced despair. There was no effect on food and water intake.

DISCUSSION

Herbal medicine is the use of plants to restore or maintain health. Phytomedicine is a term often used to denote a more scientific approach to herbal medicine, where, for example, products are standardised and concentrated to contain specified amounts of the identified active substances in the herbal products. More rigorous research is also usually undertaken.

Many people believe that herbal medicine is similar to or part of other different traditional medicine, as both systems hold a holistic view and use natural herbal ingredients. However, there are fundamental differences between these two systems, For instance, herbal medicines are based on the understanding the movement of the active alkaloid according to its characteristic. It has its unique anatomy, physiology, and pharmacology, contained in a similar structure as western medicine and science. There has been an exiting debate about the differences for identifying medicinal plants in the northern and other part of the country; which has been influenced the usage of medicinal plants in some specific cases.

My purpose for research on these medicinal herbal plants is to make more widespread Pakistan herbal medical rejuvenation, help community to realize this chronic illness, and encourage the junior herbal medicine practioner to pay more attention on these diseases by treating with herbal medicines. Particularly, that will make a great contribution to more and more Pakistani health workers involved in the field of disease research. It will improve the people quality of life. Public interest in herbal medicine therapies is growing at a significant rate, easily outpacing the research conducted into their safety and effectiveness. People are often attracted to the 'natural' and safe & soft image of these therapies, particularly in treating chronic medical conditions, for which conventional treatments are often less than completely effective.

There is variation in the quality and, therefore, the levels of the active constituents of herbal products. Herbal medicines are generally regulated as foodstuffs or dietary supplements in the UK. As such, there is the potential for self-medication, as they can be bought over the counter from most health food shops.

This study is aimed to evaluate different behavioral changes produced by the healing properties of herbs that are at last being scientifically investigated. There are two main focuses of this research. One is the examination and other was the evaluation of the effectiveness of some herbal extracts using assessment tools for behavior. This research provided a scientific basis of herbal remedies. The other direction of research is the search for the newer drugs among known plants or in new plant species[16]. To establish herbalsim on scientific grounds, Psychopharmacological screening must be carried out. Psychopharmacological screening generally turned so as to indicate simply the presence or absence of a response. Thus, the fundamental elements of a drug discovery program are the bioassays used to detect substances with biological activities. The CNS screening included Open field activity, Cage crossing, Swimming

induced depression, Radial-maze. There was a group in which 6 per group and one group was kept as control. They were provided with food and water ad-libitum and different CNS screening tests were performed. During the course of present study, three herbs Rauwolfia-Serpentina, Nux-Vomica and Anacardium were studied. Pharmacological screening of Reserpine, Nux-Vomica, Chlorpromazine and Anacardium was carried out. Rauwolfia-Serpentina has been used since centuries in folk medicine in East India. Reserpine is now used as antihypertensive and tranquilizer in western medicine[17]. Chronic reserpine treatment showed a non significant effect on water intake. Previously, it was reported that reserpine increased water intake in the light phase and the animal consumed less water in the dark phase. Other herbal drugs such as Nux–vomica and Anacardium did not produce remarkable effect[18].

In the present study, motor activity is significantly decreased in an open field. Reserpine treatment induced hypolocomotion mediated by nigral dopaminergic dysfunction[19] producing few affect on peripheral movements, rearing, grooming, immobility and defecation[20]. Nux-vomica and anacardium did not show significant effects. In conclusion, the present results show that oral intake of rauwolfia serpentoina in rats and mice's brings about behavioral changes. Reserpine affects feeding behavior and body weight.

CONCLUSIONS

On the basis of the behavioral observations for which study that have been conducted, we say with confidence that all study animals meet the standard criteria for psychopharmacological behavioral assessments during the study period. Psychopharmacological problems usually require continuous care and monitoring. Education focusing on knowledge of the disease, health, results in better care.

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"Nothing in the world is more dangerous than sincere ignorance and conscientious stupidity."

Martin Luther King Jr. (1929-1968)