

A REVIEW OF SCOPE OF ANIMAL EXPERIMENTATIONS IN HOMEOPATHY

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INTRODUCTION

Homeopathy applies to a system of medicine founded by Sir Frederick Christian Samuel Hahnemann and was introduced to the medical world in the year 1796. This system of medicine works on the basic principle of basic principles of "*Similia Similibus Curenture.*" Hahnemann himself not only produced the symptoms in healthy individual with a test drug but he also discovered that symptoms(s) so produced could be eliminated by the same or similar drug that had been processed by attenuation. Prior to the 20th century, homeopathy was limited either for its homoeopathic proving in human healthy volunteers or in the treatment of human diseases and no efforts was made to prove the scientific basis of the therapeutic efficacy of these medicines. In the recent years, many scientists are actively involved in elucidating the mechanism(s) by which these medicines produce their effects. Though no definite explanation has been put forward till to date but numerous hypothesis have been suggested to explain the possible mechanism by which these medicines produce their effects. The hypotheses are:

- Stimulates the vital forces of the body.
- Vaccine like effects.
- Supports and stimulates the immune system
- Produces antibodies

The above effects are induced in the body after the ingestion of the drug whose ionic force

and/or subdivisions are rapidly assimilated through the buccal mucosa and quickly transported to the tissues through blood for its remedial action. It has also been speculated that homoeopathic remedies having an inherent electrical charge on their sub-atomic particles have the special affinities for those tissues that become abnormal due to the influence of the disease.

ANIMAL EXPERIMENTATION IN HOMOEOPATHY

Till to date, research in homoeopathic medicines throughout the world are mainly confined in the human either for proving in healthy volunteers or for clinical verification/clinical efficacy in diseased individuals. Scanty reports for the use of homoeopathic medicines in veterinary practice, particularly in pet animals, are also available in the literature. In the beginning, there was a great dispute among the homoeopathic physicians of Great Britain regarding the introduction of animal experimentation in homoeopathy. However, some experimental work had been reported at Matie Curie Hospital Oxted (Capel, 1981) for finding out the possible biochemical mechanism in order to explain the efficacy of homoeopathic medicines in cancer and the importance of trace elements in homoeopathic medicines. Maliekal (1996) had reported that Kali muriaticum, Phytolacca decandra, Hydrastis canadensis, and Carsinosinum could reduce tumour formation in mice while Chaudhary (1980) had shown that Kali Phos., Calc. Phos. and Ferrum

Phos., all in 30x potencies, were effective in the cure of artificially induced fibrosarcoma in Swiss mice.

In recent years many scientists are actively involved in studying the effect homoeopathic medicines in animal experimentation and have demonstrated the efficacy of these medicines. Some of the important areas where experiments on animals carried out by the author and his associates and few homoeopathic medicines which were found to be effective in animal experimentation and reported in different annual reports of the laboratories are being compiled and reported in this article.

PRELIMINARY ACUTE AND SUBACUTE TOXICITY STUDIES

Homoeopathic drugs are considered to be quite safe when used clinically particularly in high potencies. However few homoeopathic drugs are used in low potencies and as a finished product. Considering the fact that finished product of homoeopathic drugs which has maximum concentrations of the chemical constituents are prescribed frequently in material doses in clinical diseases as well as to healthy volunteers for drug proving, the above study was undertaken to find out any possible undesirable side effects of these drugs in laboratory animals.

I. Studies in Albino Mice and Rats

In last two decades, very preliminary acute and sub acute toxicity studies of 27 homoeopathic drugs were carried out in albino mice and rats in our laboratory. With the exception of few drugs which were studied in 30 to 200 potencies, toxicity study of most of the drugs were carried out in the mother tincture form. Detailed report of 13 homoeopathic drugs has already been published earlier by Singh and Varma (1984). Of 27 drugs, *Calotropis gigantea*, *Acidum formicum*, *Carica papaya* *Digitalis purpurea*, *Gossypium*

herbaceum, *Baryta carb 30* and *Baryta mur 30* were found to be toxic since varying degree of mortality was observed during the period of studies. Remaining drugs (*Aegle folia*, *Azadirachta indica*, *Baryta carb 200*, *Baryta mur 200*, *Berberis vulgaris*, *Bixa orellana*, *Boerhaavia diffusa*, *Cannabis indica*, *Cannabis sativa*, *Cassia fistula*, *Chelone glabra*, *Crataegus oxyacantha*, *Cuprum oxydatum nigrum*, *Embelia ribes*, *Ficus religiosa*, *Guaicum officinale*, *Hydrocotyle asiatica*, *Quassia amara*, *Robinia pseudacacia*, *Solanum xanthocarpum*, *Thymol* and *Tylophora indica*) were found to be quite safe as they did not produce any untoward or toxic effects.

II. Studies in Albino Rabbits

Preliminary acute and sub acute toxicity studies of 34 homoeopathic drugs mainly in mother tincture forms were carried out in adult albino rabbits during the last two decades in our laboratory. The drugs were administered in 0.2 to 1.0 ml/rabbit twice or thrice daily for one to two weeks. Only two drugs were found to be toxic. *Digitalis purpurea* mother tincture when administered in doses of 0.2 ml/rabbit thrice daily for 15 days produced laziness after 5th day of drug administration. Food consumption decreased. On 7th day few rabbit developed difficulty in breathing, auricular and ventricular fibrillation and partial heart block. Autopsy finding of dead animal showed stoppage of the heart during systole. Likewise, *Camellia sinensis* mother tincture when administered in doses of 0.2 ml/rabbit twice daily for 5 days produced laziness; and death of the animal within a week when administered in doses of 0.4 ml/rabbit twice daily. Remaining drugs (*Abroma augusta*, *Acalypha indica*, *Aegle marmelos*, *Agave americana*, *Allium cepa*, *Allium sativum*, *Anacardium occidentale*, *Atista indica*, *Baryta iodata*, *Berberis vulgaris*, *Bixa orellana*, *Capsicum annum*, *Carica papaya*, *Cinchona officinalis*, *Cissampelos pareira*, *Citrus*

decumana, Coffea cruda, Cynara scolymus, Gossypium herbaceum, Guaicum officinale, Holarrhena antidysenterica, Hydrocotyle asiatica, Iberis amara, Magnolia grandiflora, Murraya koenigii, Quassia amara, Quillaja saponaria, Robinia pseudoacacia, Santalum album, Verbascum thapsus, Viscum album and Withania somnifera) were found to be quite safe as untoward or toxic effects were not observed during the study period. However, when santalum album mother tincture was injected intradermally, the skin at the site of injection swelled and became red in the beginning, bluish and necrotic later on the second and third days, showing that S. album is an irritant to the skin. It took more than a week to heal the damaged skin.

EFFECT OF HOMOEOPATHIC MEDICINE ON CENTRAL NERVOUS SYSTEM

During the course of acute and sub acute toxicity study in mice and rats, gross effect of homoeopathic drugs on the central nervous system viz. alertness, passivity, motor incoordination, equilibrium maintenance, spontaneous motor activity, posture and behaviour was also observed. Among the drugs tested, Azadirachta indica, Berberis vulgaris, Bixa orellana, Cannabis indica, Cannabis sativa and Cassia fistula produced laziness and drowsiness in mice lasting for 1-2 hr. Other drugs did not have any noticeable effect.

I. Effect on Spontaneous Motor Activity

Effect of 7 homoeopathic drugs was assessed on the spontaneous motor activity of albino mice. Robinia pseudoacacia and Cynodon dactylon mother tincture administered orally in doses of 0.2 ml/mouse were found to increase spontaneous motor activity while Bixa orellana and Quassia amara mother tincture had an opposite effect. On the other hand, Ficus religiosa, Guaiacum officinale and Tribulus terrestris mother tincture did not have any appreciable

effect on spontaneous motor activity. Cynodon dactylon mother tincture had also been reported to antagonize the spasm produced by acetylcholine, histamine and 5-hydroxytryptamine in isolated guinea pig ileum (Nandi and Mazumdar, 1977).

II. Effect on Conditioned Response

In the beginning adult albino rats were trained to climb a pole in response to an electric shock. Effects of four homoeopathic drugs namely Bixa orellana, Guaicum officinale, Quassia amara and Robinia pseudoacacia were evaluated. None of the drug had any influence on the conditioned response aroused to electric shock even in doses up to 0.5 ml/rat of the mother tincture.

CARDIOVASCULAR EFFECTS OF HOMOEOPATHIC MEDICINES

I. Effect on Frog Heart Perfusion

Effect of six homoeopathic drugs was tested on frog heart perfusion. Infusion of 0.2 ml of Iberis amara aqueous extract had depressant effect on myocardial contractility and on heart rate while in 0.4 ml dose it stopped the heart contraction for about 45 seconds followed by an accelerated force of contraction and heart rate before it returned to normal. Likewise, infusion of 0.4 ml dose of Digitalis purpurea mother tincture reduced the force of contraction and heart rate but raised the basal tension indicating thereby a decreased size of the heart. Infusion of 0.6 ml dose of Digitalis purpurea resulted into complete stoppage of the heart for a period of about 10 min. Afterwards, heart started to regain slowly its force of contraction and its rate and took about 25 min to recover its normal functioning. Similarly, infusion of 0.1 ml dose of Cinchona officinalis mother tincture stopped the heart initially for about 2-3 min followed by beating of heart at a much faster rate for about 6-8 min until

it finally returned to normal. *Hydrocotyle asiatica* mother tincture had a slight depressant effect on heart in doses up to 0.4 ml. Such effects were not seen with the infusion of equal dose of alcohol. On the other hand, mother tincture of *Datura metel* and *Withania somnifera* did not have any apparent depressant effect on the heart rate and on myocardial contractility.

II. Effect on Rat Blood Pressure

Effect of two homoeopathic drugs was tested on blood pressure of pentobarbitone sodium anaesthetized adult albino rats. *Iberis amara* mother tincture produced dose dependent transient fall in blood pressure lasting for 30 seconds. The respective fall in blood pressure was 8 mm, 20 mm and 25 mm of Hg with 0.2, 0.5 and 1.0 ml dose. On the contrary, *Digitalis purpurea* mother tincture produced a triphasic response on the blood pressure. Infusion of 0.4 ml dose of mother tincture produced an immediate fall from 88.6 mm of Hg to 53 mm of Hg followed by a sharp rise to 118 mm of Hg and a fall again to 95 mm of Hg. Subsequently the blood pressure rose again slowly and was 110-105 mm of Hg after 20 min of infusion of drug.

III. Antithrombic Activity of Homoeopathic Medicine in Albino Mice

In traditional medicine, the tincture of the ripe berries of *Crataegus oxyacantha* Linn, commonly known as "Hawthorn or hedge thorn," is reported to be useful in heart weakness. Irregular heart beats, hardening of the arteries, artery spasms and in angina. In homoeopathy too, *Crataegus oxyacantha* mother tincture has often been prescribed in material doses in chronic heart diseases with extreme weakness, dyspepsia and nervous prostration. It is also considered as a boon for the treatment of arteriosclerosis and thromboembolic conditions, since it has been reported to be capable of dissolving the crustaceous and calcareous

deposits in the arteries. On the other hand, *Baryta carb* is reported to be useful in the degenerative changes in the arterial wall, arterial fibrosis, aneurysm and senility, while *Baryta mur* is considered to be useful in arteriosclerosis associated with cerebral and cardiac symptoms and high systolic pressure and a comparatively low diastolic tension. Singh (2001) had reported that *Crataegus oxyacantha* mother tincture when administered in doses of 0.05 ml/mouse twice daily before the intravenous injection of collagen+epinephrine mixture (0.1 ml/mouse) had considerable protective effect (55.6%). Singh had reported further that the mice pretreated with *Baryta carb* and *Baryta mur* in 200 potency when subjected to aggregating challenge demonstrated an initial decreased in spontaneous motor activity followed by drowsiness and piloerection. Most animals sat quietly on the experimental table and moved only when they were teased, others showed abdominal breathing, gasping and paralysis. The protective effect against aggregating challenge of these two drugs was less ($\geq 50\%$) as compared to that of *Crataegus oxyacantha* mother tincture. On the contrary, these two drugs in their 30 potencies did not reveal any protective effect against experimentally induced thrombosis in mice.

EFFECT OF HOMOEOPATHIC MEDICINES ON BLOOD GLUCOSE AND BLOOD CHOLESTEROL LEVEL

Effect of five homoeopathic drugs (*Abroma augusta*, *Acalypha indica*, *Allium cepa*, *Allium sativum* and *Camellia sinensis*) was evaluated on the blood glucose and blood cholesterol levels of healthy adult albino rabbits. Mother tinctures of these drugs were administered orally in doses of 0.2 ml to 0.4 ml/rabbit twice daily for 16 days. Blood samples were collected before and after drug treatment for estimation of blood glucose and blood cholesterol. *Camellia sinensis* (0.2 ml/rabbit twice daily) had both

hypoglycaemic and hypocholesterolemia effect while *Acalypha indica* and *Allium sativum* had only hypoglycaemic and hypocholesterolemia effect respectively. On the other hand, *Abroma augusta* and *Allium cepa* had no effect on the normal blood glucose and blood cholesterol levels of adult rabbits.

ANTIULCEROGENIC AND ULCEROGENIC EFFECT OF HOMOEOPATHIC MEDICINE

In homoeopathy, *Kali bichrom* and *Geranium maculatum* have been prescribed frequently in patients suffering from gastric ulcers and *Symphytum officinale* for duodenal ulcers on the basis of sensations and modalities of symptoms. It is not possible for experimental animals to describe the sensations and modalities of symptoms. Therefore, Singh et al (1988) had evaluated the effect of homoeopathic medicines on the basis of the pathological symptoms in experimentally induced gastric and duodenal ulcers.

I. Aspirin Induced Gastric Ulcer

In adult albino rats, gastric ulcers were induced by Aspirin suspension (200 mg/kg). Prior treatment with *Kali bichrom* 200 and *Pulsatilla nigricans* mother tincture had significant protective effect against aspirin induced gastric ulcers while such treatment with *Kali bichrom* 3x and *Pulsatilla nigricans* 200 had an opposite effect. *Geranium maculatum* and *Symphytum officinale* pretreatment did not have any effect on Aspirin induced gastric ulcers in adult rats.

II. Cysteamine Induced Duodenal Ulcer

In adult albino rats, duodenal ulcers were produced by subcutaneous administration of cysteamine hydrochloride in a dose of 300 mg/kg. Prior treatment of adult rats with *Kali bichrom* 200 and *Symphytum officinale* 200 had protective effect against cysteamine induced duodenal

ulcers while *Kali bichrom* 3X and *Pulsatilla nigricans* mother tincture as well as its 200 potency did not have any effect.

ANTIFERTILITY EFFECT OF HOMOEOPATHIC MEDICINE

Control of population growth is a major problem of developing countries including India and has assumed a national importance of first order. Hence, large number of research workers and clinicians are actively involved in finding out either a new antifertility drug or a new technique of contraception in order to combat the population growth. Initially, oestrogen and progesterone preparations were used for suppressing ovulation in females but prolonged and repeated use of them is associated with nausea, vomiting, weight gain, thrombosis and hypertension. In order to get rid-of the above drawbacks of these steroid contraceptives, many research workers are keenly interested in developing socially acceptable, cheap, easily available non-steroidal preparation. Homoeopathic drugs are considered quite safe for prolonged use. With the same objectives, Prof. Mrs. K. Chandrasekhar and her colleagues, at Banaras Hindu University, Varanasi, were actively engaged in studying the antifertility effect of homoeopathic medicines in albino rats. They had reported that *Pulsatilla nigricans* in 30 and 200 potencies possessed promising progesterone like and *Caulophyllum thalictroides* in 200 potencies had oestrogenic activities (Prasad and Chandrasekhar, 1978; Chandrasekhar et al. 1976, Kumar et al, 1981). Singh had also evaluated six homoeopathic drugs (*Acidum formicum*, *Aegle folia*, *Calotropis gigantea*, *Cassia fistula*, *Ficus religiosa*, and *Tylophora indica*) in albino mice and three drugs (*Pulsatilla nigricans*, *Caulophyllum thalictroides* and *Natrum mur.*) in albino rats. None of the drug had any effect on the implantation of the ova in the uterine horns of adult females of proven fertility either in albino mice or rats when given in mother tincture form. *Pulsatilla nigricans* mother tincture had some resorptive activities as total numbers of pups born were significantly

less than the total numbers of implants observed on 11 day of pregnancy on laprotomy.

REDUCTION IN ALCOHOL MORTALITY

Potentized *Nux vomica* is reported to antagonize the effect of alcoholism (Kent, 1962, Boericke, 1976). Paul et al (1992) had reported that potentized *Nux vomica* could reduce voluntary intake of alcohol by rats while Sukul et al (1999) had reported that duration of hypnosis produced by 25% alcohol intraperitoneally at 4g/kg body wt. in male albino mice was considerably reduced if the mice were pretreated with *Nux vomica* 30c (0.05 ml of drug diluted with 2 ml of sterile distilled water) in doses of 0.05 ml/mouse.

Singh and Varma (1984) had also reported that *Solanum xanthocarpum* mother tincture when administered in doses of 0.1 ml/mouse thrice daily for 6 days had considerable protective effect against alcohol induced mortality in male albino mice. The protective effect of drug was even more significant if the drug was prepared by percolation technique as compared to the maceration technique.

WOUND HEALING EFFECT OF HOMOEOPATHIC MEDICINE IN ALBINO RATS

In homoeopathy, *Calendula officinalis* (Marigold) is supposed to be one of the leading medicines used for the treatment of aseptic wounds. It promoted healthy granulation and rapid healing by first intention. Singh et al (1989) proved it experimentally also. They produced superficial circumscribed wounds on the back of the rat approx. They produced superficial circumscribed wounds on the back of the rat approx. 2cm in diameter aseptically under pentobarbitone anaesthesia. Cotton swabs dipped in *Calendula officinalis* mother tincture, alcohol and distilled water were applied topically twice daily for 2 weeks. At the end of the

experiment, 99% of wound healing took place in *Calendula* group when compared to 77% in alcohol group and 54% in control group applied distilled water.

ACKNOWLEDGEMENT

Author is grateful to Director, CCRH, New Delhi, Project Officer, DSU (H), Ghaziabad and Project Officer, CVU (H) Varanasi for extending the necessary facilities for carrying out the experimental research work and in the preparation of this manuscript.

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CORRIGENDUM:

The name of Dr. (Mrs.) Shakti Dey Research Officer (H) omitted in Quarterly Bulletin Vol. 24 (3&4) 2002 inadvertently from Drugs Code No. 6103, 6003, 6603, 7003 proved at D.P.R.U. Kolkata.