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Preclinical Evaluation of Antidotal Property of *Mritasanjeevana agada* in Poisoning- A Study Protocol

Nilima Wadnerwar[1*]

[1]Department of Agadtantra, Mahatma Gandhi Ayurved College, Hospital & Research Centre, Salod(H), Datta Meghe Institute of Medical Sciences (DU), Wardha, Maharashtra, India.

Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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Study Protocol

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ABSTRACT

Background: As the poisoning is becoming a threat to rural India, it is necessary to increase the survival time to avail the primary treatment. For the treatment of poisoning, Agada is described in Ayurveda as an antidote. Agada is a polyherbal or herbomineral formulation constituted with combination antitoxic drugs along with some antioxidant, immunomodulator or hepatoprotective drugs. But they need to be revalidated for their efficacy and safety on the basis of contemporary assessment parameters

Aim: Evaluation of antidotal property of *Mritasanjivana Agada* in poisoning.

Objectives:

1) To increase the survival time after the administration of *Mritasanjivana Agada* in snake venom and aluminium phosphide poisoning in albino mice.
2) To compare the efficacy of *Mritasanjivana Agada* and Anti-snake venom as an antidote.
3) To standardize the *Mritasanjivana Agada.*

Methodology: *Mritasanjeevana Agada* will be prepared and standardized. Cobra venom poisoning and aluminium phosphide poisoning have been selected as the representative for the animate poison and artificial/ synthetic poison. After inducing poisoning in mice, one group will receive its

**Corresponding author: E-mail: dr.nilima_wadnerwar@rediffmail.com;*

standard antidote and other will receive standard antidote with *Mritasanjivana Agada.* The third group will receive only *Mritasanjivana Agada* without its standard antidote. All the groups will be assessed on the basis of hematology, biochemistry, Superoxide dismutase (SOD) level, Malondialdehyde (MDA) level and histopathology in case of death of the animals.
Results: *Mritasanjeevana agada* is expected to increase the survival time in the treatment of snake venom and aluminium phosphide poisoning in albino mice.
Conclusion: *Mritasanjeevana agada* may be as efficacious as Anti-snake venom as an antidote.

Keywords: Antidotal property; Mritasanjeevana agada; Cobra venom poisoning; aluminum phosphide poisoning.

1. INTRODUCTION

Poisoning is very common global public health problem. It possesses 45th rank in the total death in the whole world. Near about one million people die due to poisoning each year. Approximately 3,70,000 deaths per year are due to pesticide poisoning. According to WHO data in 2012, it is estimated that about 1,93,460 people died worldwide due to unintentional poisoning [1]. The incidence of poisoning in India is among the highest in the world. It is estimated that more than 50,000 people die every year due to poisoning in India [2]. Poisoning is the fourth most common cause of mortality especially in rural India where the mortality rate varies from 15- 30% [3-4].

According to the National Poisons Information Centre, New Delhi, analysis of poisoning calls showed that the highest incidence of poisoning was due to household agents (44.1%) followed by drugs (18.8%), agricultural pesticides (12.8%), industrial chemicals (8.9%), animals bites and stings (4.7%), plants (1.7%), unknown (2.9%) and miscellaneous groups (5.6%) [2]. Treatment protocols and effective antidotes are available even though the rate of mortality due to poisoning is high. The causes of death due to poisoning depends on various factors like dose of poison, late diagnosis in case of snake bite, delayed reporting of cases especially in rural areas etc. This may lead to worsened condition of the patient.

In Ayurveda, various antidotes are described for different types of poisoning for internal as well as local use in emergency condition. *Mritasanjeevana agada* [5] which is a herbo-mineral antidote, is indicated in all types of poisoning to save the person who is likely to die or apparently dead due to poisoning.

***Mritasanjeevana Chikitsa* [6]:** These are the twenty four treatment modalities which help to cure patient afflicted with poison. It is one of the ancient classical therapy through which the life of individual can be regained. Nowadays this therapy has disappeared. This therapy was considered as universal antidote which can be used to nullify the toxic effect of all types of poison. In this treatment *Mritsanjeevana Agada* is used to revive the poisoned patient who is apparently dead. It is described that this *Agada* was produced by Lord Brahma before the emergence of *Amruta* (Nectar).

***Mritasanjeevana Agada* [5]:** It is described that all the drugs should be collected in *pushya nakshatra.* All the drugs are taken in equal quantity and are triturated well to form paste. Then pills should be prepared from all the paste.

In the present study, *Mritasanjeevana Agada* will be prepared according to the classical reference and it will be standardized on the basis of physicochemical parameters as well as to estimate the heavy metal content with the help of inductively coupled plasma atomic emission spectroscopy (ICP-AES). Cobra venom poisoning and aluminium phosphide poisoning have been selected as the representative for the animate poison and artificial/ synthetic poison with the aim to evaluate the antidotal property of *Mritasanjeevana Agada* in these two poisoning conditions to increase the survival time after the administration of *Mritasanjeevana Agada* in snake venom and aluminium phosphide poisoning in albino mice. To find out whether *Mritasanjeevana Agada* is as efficacious as Anti-snake venom in snake venom and aluminium phosphide poisoning respectively, the study groups will be compared with *Mritasanjeevana Agada.*

2. MATERIALS AND METHODS

Type of study- Experimental Analytical and Animal Study

Table 1. Drugs used in *MritasanjeevanaAgada*

SN	Drug Name	Latin Name	Part used	Pharmacological Activity [7]
1	*Sprikka*	*Delphinium zalilAtich&*Henssl	Leaves	Vishaghna, kushtha, raktavikara
2	*Plava*	*Cyperus rotundus Linn*	Tuberose	Diaphoretic, diuretic,
3	*Sthauneyaka*	*Taxus baccata Linn*	Leaves	Digitalis like action
4	*Kanksi (Saurashtrika),*	Alum	Purified	Tridoshghna
4	*Shaileya*	*Parmeliaperlata Ach*	Leaves	Mild diuretic, vishanashak,
5	*Rochana*	bile of cow		Vishaghna, diuretic,
6	*Tagara*	*Valerianawallichii* DC.	Root	Vishaghna, nerve stimulant, chetanakaraka, diaphoretic, CNS depressant, cardiac tonic
7	*Dhyamaka(Khasha)*	*Cymbopogon martini Roxb. Wats.*		Diaphoretic, diuretic, stimulant, chetanakaraka
8	*Kunkuma*	*Crocus sativus Linn.*	stigma	Vishaghna, diuretic
9	*Mamsi*	*Nardostachysjatamansi DC*	Root	diuretic, sandnyasthapaka, cardiac tonic
10	*Surasa*	*Ocimum sanctum Linn.*	Florescence	cardiac tonic, diaphoretic
11	*Ela*	*Elettaria cardamomum Maton.*	Fruit, seed	Diuretic, shwas, kasa
12	*Ala (Haratala)*	Orpiment, Yellow Arsenic, Arsenic trisulphide	Purified	Vishaghna, kushtha, raktavikara
13	*Kushthaghna*	*Acacia catechu Wild.*	Bark	Skin disease, pandu, raktavikara
14	*Brhati*	*Solanum indicum Lin n.*	Fruit	cardiac tonic, shwasa, kasa
15	*Shirisha*	*Albizzia lebbeckBenth.*	Flower	Vishaghna,kasa, shotha
16	*Sriveshtaka*	*Pinus longifolia Roxb.*	resinous exudation obtained from the trunk	Stimulant, diuretic, diaphoretic, vishaghna, Moorcha, kasa
17	*Padmacharati*	*Clerodendrum indicum Linn. (Kuntze)*	Root	Vishaghna,kasa, shwasa, diuretic
18	*Vishala(Indrayana)*	*TcitrulluscolocynthisSchard*	Seed	Vishaghna,kasa, shwasa, diuretic, Shotha, kaphanashaka
19	*Suradaru*	*Cedrus deodara Roxb. Loud.*	Bark	diuretic, diaphoretic, shwasa, kasa
20	*Padmakesara*	Nelumbiumspeciosum Wild.	Keshara	Vishaghna, shothaghna
21	*Savaraka*	*SymplocosracemosaRoxb.*	Bark	Raktavikara, shothaghna
22	*Manahshila*	Realgar, Red Arsenic, Arsenic disulphide	Purified	Vishaghna,kasa, shwasa, raktavikara
23	*Kaunti (Renuka)*	Piper aurantiacum Wall.	Seed	Vishaghna, shothaghna, diuretic,
24	*Jati*	Jasminum grandiflorum Linn.	Leaves	Skin diseases, Vranaropana
25	*Arkapushpa Rasa*	Calotropis proceraAit.	Flower juice	Vishaghna, Raktapittaghna, Kushtha, Krumi,

SN	Drug Name	Latin Name	Part used	Pharmacological Activity [7]
				kasphaghna
26	*Haridra*	Curcuma longa Linn.	Tuberose	Vishaghna, Vranaropana, Raktashodhaka, Shothahara
27	*Daruharidra*	Berberis aristata DC.	Root	Snakebite, Bactericidal
28	*Hingu*	Ferula narthex Boiss.		Snakebite, scorpion bite, nervine tonic
29	*Pippali*	*Piper longum* Linn.	Fruit	Rasayana
30	*Laksha*	*Luccifer lacca* Kerr.	Latex	Raktapittaghna, Tonic
31	*Jala (Hribera)*	*Pavonia odorata* Wild.	Root	Stimulant, Tonic, Raktapittaghna
32	*Mudgaparni*	*Phaseolus trilobusAit.*	Leaves	Tridoshanashaka, shothaghna, balya, mooshakavishahara
33	*Chandana*	*Santalum album*	Bark	Vishaghna, Cardiac tonic, shwasa, diuretic
34	*Madhuka*	*Glycyrrhiza glabra Linn.*	Root	Vishaghna, tonic, rasayana, diuretic
35	*Madana*	*Randiadum entorum Lam.*	Fruit pulp	Emetic, snake bite
36	*Sindhuvara*	*Vitex negundo Linn.*	Leaves	Vishaghna, shothaghna, Rasayana, diuretic
37	*Shampaka*	*Cassia fistula Linn.*	Fruit pulp	Virechaka (Mild purgative)
38	*Lodhra*	*Symplocos racemosa*	Bark	Raktavikara, shothaghna
39	*Mayuraka (apamarga*	*Achyranthes aspera Linn.*	Root	Snake bite, scorpion bite, rat bite, dog bite
40	*Gandha-phala (priyangu*	*Aglaianrox burghiana Miq.*	Fruit	Vishaghna, shothaghna, Rasayana, diuretic
41	*Nakuli (Rasna)*	*Pluchea lanceolata* Oliver &Hiern.	Root	Vishaghna, Snake bite, spider bite, scorpion bite, rat bite,
42	*Vidanga*	*Embeliaribes burm.f.*	Fruit	Snake bite, scorpion bite, diuretic, Rasayana

The study includes two phases:

I. Standardization of *Mritasanjeevan Agada*:
II. Experimental Animal study

I. Standardization of *Mritasanjeevan Agada*

Table 2. Material required for preparation of *Mritasanjeevan Agada*

SN	Drug Name	Latin Name	Part used	Quantity
1	*Sprikka*	*Delphinium zalilAtich&*Henssl	Leaves	100gm
2	*Plava*	*Cyperus rotundus Linn*	Tuberose	100gm
3	*Sthauneyaka*	*Taxus baccata Linn*	Leaves	100gm
4	*Kanksi (Saurashtrika),*	Alum	Purified	100gm
4	*Shaileya*	*Parmeliaperlata Ach*	Leaves	100gm
5	*Rochana*	bile of cow		100gm
6	*Tagara*	*Valerianawallichii* DC.	Root	100gm
7	*Dhyamaka*	*Cymbopogon martini Roxb. Wats.*		100gm
8	*Kunkuma*	*Crocus sativus Linn.*	stigma	100gm
9	*Mamsi*	*Nardostachysjatamansi DC*	Root	100gm
10	*Surasa*	*Ocimum sanctum Linn.*	Leaves, seeds	100gm
11	*Ela*	*Elettaria cardamomum Maton.*	Fruit, seed	100gm
12	*Ala (Haratala)*	Orpiment, Yellow Arsenic, Arsenic trisulphide	Purified	100gm
13	*Kushthaghna*	*Acacia catechu Wild.*	Bark	100gm
14	*Brhati*	*Solanum indicum Linn.*	Root	100gm
15	*Shirisha*	*Albizzia lebbeckBenth.*	Flower	100gm
16	*Sriveshtaka*	*Pinus longifolia Roxb.*	resinous exudation	100gm
17	*Padmacharati*	*Clerodendrum indicum Linn. (Kuntze)*	Root	100gm
18	*Vishala*	*TcitrulluscolocynthisSchard*	Root	100gm
19	*Suradaru*	*Cedrus deodaraRoxb. Loud.*	Bark	100gm
20	*Padmakesara*	Nelumbiumspeciosum Wild.	Keshara	100gm
21	*Savaraka*	*SymplocosracemosaRoxb.*	Bark	100gm
22	*Manahshila*	Realgar, Red Arsenic, Arsenic disulphide	Purified	100gm
23	*Kaunti (Renuka)*	Piper aurantiacum Wall.	Seed	100gm
24	*Jati*	Jasminum grandiflorum Linn.	Leaves	100gm
25	*Arkapushpa Rasa*	Calotropis proceraAit.	Flower juice	100gm
26	*Haridra*	Curcuma longa Linn.	Tuberose	100gm
27	*Daruharidra*	Berberis aristata DC.	Root	100gm
28	*Hingu*	Ferula narthex Boiss.		100gm
29	*Pippali*	Piper longum Linn.	Fruit	100gm
30	*Laksha*	Lucciferlacca Kerr.	Latex	100gm
31	*Jala (Hribera)*	Pavonia odorata Wild.	Root	100gm
32	*Mudgaparni*	*Phaseolus trilobusAit.*	Leaves	100gm
33	*Chandana*	*Santalum album*	Bark	100gm
34	*Madhuka*	*Glycyrrhiza glabra Linn.*	Root	100gm
35	*Madana*	*Randiadumentorum Lam.*	Fruit pulp	100gm
36	*Sindhuvara*	*Vitex negundo Linn.*	Root	100gm
37	*Shampaka*	*Cassia fistula Linn.*	Fruit pulp	100gm
38	*Lodhra*	*Symplocosracemosa*	Bark	100gm
39	*Mayuraka (apamarga*	*Achyranthes aspera Linn.*	Root	100gm
40	*Gandha-phala (priyangu)*	*AglaianroxburghianaMiq.*	Fruit	100gm
41	*Nakuli (Rasna)*	*Pluchea lanceolata* Oliver &Hiern.	Root	100gm
42	*Vidanga*	*EmbeliaribesBurm.f.*	Fruit	100gm

2.1 Methodology

Collection, Identification and Authentication of drugs: All the drugs will be collected from authentic sources.

Preparation of *Mritasanjeevan Agada*: Physical impurities will be removed from all the drugs. Powder of all drugs will be prepared separately. Then powder of all drugs will be taken in equal quantity in a *kharala* and will triturated well. Tablets will be prepared from it.

2.1.1 Analysis

Physicochemical Analysis:

i) Loss on drying
ii) Total Ash value
iii) Water soluble Ash Value
iv) Acid insoluble ash value
v) Alcohol extractive value
vi) Water extractive value
vii) Sieve analysis
viii) pH
ix) Microbial count

Physicochemical study will be conducted in Analytical Laboratory, M.G.A.C. H. & R.C. Salod (Hirapur), Wardha.

ICP –AES (Qualitative and quantitative): Inductively coupled plasma atomic emission spectroscopy (ICP-AES) for qualitative and quantitative analysis of Arsenic at IIT, Powai, Mumbai.

II. Experimental Animal Study:

2.1.2 Materials

1) Swiss Albino mice 80
2) Indian Cobra Venom
3) Aluminiun Phosphide tablets
4) Lyophilised Inj Polyvalent Antisnake Venom (PVASV)
5) Distilled water 5 litres.
6) Instruments required for experimental study

2.1.3 Methodology

Drug collection

- Cobra venom and Lyophilised Inj Polyvalent Antisnake Venom (PVASV) will be procured from Haffkin Institute, Mumbai.
- Aluminium phosphide Tablets will be purchased from market.
- Distilled water will be purchased from GMP certified company.

1. Animal Study/Experimental Evaluation:

2.1.4 Experimental study design

Place of Study: APT Research Foundation, Pune

Sample: Healthy Adult Swiss Albino Mice weighing 28-30gms.

Animal Species: Swiss Albino Mice

Control group: 03

Experimental group: 03

Total groups: 06

Sample Size (Number of animals): Ten animals in each group = 10 x 6=60.

Sex: 30 male and 30 female.

Inclusive Criteria: 1. Healthy albino mice of either sex will be considered.
2. Mice weighing 28-30gms

Exclusive Criteria: 1. Less than weighing 28-30gms
2. Pregnant and diseased mice.
3. Mice which are under trial of other experiments.

Test compound/ study drug: *Mritasanjeevana Agada*
Vehicle control: Distilled water orally

Administration of test drug (*Mritasanjeevana Agada*): Fine suspension of *Mritasanjeevana Agada* will be prepared in distilled water as per dose level and it will administered 30 minutes before the administration of snake venom or aluminium phosphide to animals of the experimental group on the first day of experiment. From the second day, fresh suspension of the test drug will be prepared every day and administered between 10:00 am to 10:30 am daily for minimum seven consecutive days or till the recovery to each mouse by a single oral gavage. The animals will be dosed using a stainless steel intubation needle fitted onto a suitably graduated syringe.

The dosage volume administered to individual mice will be adjusted according to its most recent recorded body weight.

Route of administration of Drug:

- Snake venom will be administered intramuscular (IM)
- Inj Polyvalent Antisnake Venom (PVASV) will be administered intravenous (IV).
- Aluminium Phosphide will be administered orally.
- Study drug will be administered orally.

Duration of study drug administration: Minimum 7 Days and till the recovery of animals.

Comparison: All Groups are compared.

Dose calculations: Dose of the drug will be calculated by extrapolating the human therapeutic dose to mice on the basis of body surface area ratio.

Formula for conversion of dose Animal dose= Human dose x 0.018 (conversion factor)

1) Cobra venom

Fatal dose -12mg of dried venom for human beings
Animal dose=7.2mg/kg body weight of mice IM

2) Aluminium phosphide

Fatal dose – 3 gm for human beings
Animal dose=1.8 mg/kg body weight of mice orally

3) Inj Polyvalent Antisnake Venom

Therapeutic dose for human beings-bolus dose of 200 ml ASV and repeated doses of 100 ml ASV every 6 hours
Animal dose=120 ml/kg body weight of mice IV

Mritasanjeevana Agada: Therapeutic dose 125 mg BD= 250 mg orally daily dose for human being
Animal dose= 150mg/kg body weight of mice orally

2.2 Pre-Experimentation Phase

2.2.1 Acclimatization of animals

- Period – 7 days (Recording of body weight and food intake twice in a week)

Experimentation phase

- Test compound exposure – multiple dose (once daily for minimum 7 Days and till the recovery of animals)
- Mortality 6/12/24 hours
- Body weight (Before and after experiment)
- Food consumption (once daily)
- Cage side activity
- Neurological examination
- Urine qualitative test
- **Hematology -** Hb, RBC, WBC, Prothrombin time, Platelet count, Differential count, MCV, MCH, MCHC
- **Biochemistry-**Blood glucose, total protein, serum urea, creatinine, sodium, potassium, Total Bilirubin, SGOT, SGPT, Alkaline phosphatase, Ck-Mb (Creatinine phosphokinase), Cholesterol, triglycerides, LDL, HDL, VLDL.
- **Superoxide dismutase (SOD) Level**
- **Malondialdehyde (MDA) Level**
- **Histopathology –** Liver, heart, brain, kidney, lungs, stomach, intestine, pancreas, spleen, testes / ovaries (Only if the animals die).

Table 3. Grouping of animals

Group	Group Description	Intervention
Group I	Vehicle control group	Distilled water orally
Group II	Control group 1	Cobra venom poisoning followed by Inj Polyvalent Antisnake Venom (PVASV)
Group III	Control group 2	Aluminium Phosphide poisoning
Group IV	Treatment group 1	Cobra venom poisoning Followed by Inj. PVASV & study drug orally
Group V	Treatment group 2	Cobra venom poisoning followed by study drug orally
Group VI	Treatment group 3	Aluminium Phosphide poisoning followed by study drug orally

2.2.2 Housing and feeding conditions

As per the OECD Guidelines following conditions should be maintained,

- The temperature in the experimental animal room should be 22ºC (±3ºC).
- Humidity should be at least 30% and preferably not exceed 70%, other than during room cleaning; the aim should be 50 -60%.
- Lighting should be conventional laboratory diet may be used with an unlimited supply of drinking water.
- Animals may be housed individually or be caged in small groups of the same sex.

3. OBSERVATIONS

The following parameters will be observed during the course of the study.

- Body weight: Before the start of drug administration and at the end of the study.
- Food Intake: Before the start of drug administration, then once daily and at the end of the study.
- Survival time in all groups
- Survival rate in all groups
- Hematological examination -Before the start of drug administration and at the end of the study.
- Renal and hepatic function tests -Before the start of drug administration and at the end of the study.
- Superoxide dismutase (SOD) Level
- Malondialdehyde (MDA) Level
- Animals found dead during the examination will be autopsied as soon as possible. A macroscopic examination will be done of organs and tissues.
- Organ measurement and Histopathological examination will be performed to identify the cause of death and the nature (severity or degree) of the toxic changes present.

4. ASSESSMENT PARAMETERS

1. Survival time in all groups
2. Survival rate in all groups
3. Hematological examination
4. Biochemical Examination
5. Superoxide dismutase (SOD) Level
6. Malondialdehyde (MDA) Level
7. Histopathological examination in case of death of animal during experiment

4.1 Statistical Analysis

The results will be presented as Mean± Standard Error (SE) of means in each group. Statistical comparisons will be performed by both paired, unpaired student's t test followed and One Way ANOVA test to determine the significant difference between the groups at $P<0.05$ (level of significance).

5. RESULTS

- *Mritasanjeevana Agada* is expected to increase the survival time in the treatment of snake venom and organophosphorus poisoning in Swiss albino mice.
- It is expected to be as efficacious as Anti-snake venom as an antidote.
- If so, it can also be used in the cases where no antidote is available.
- The drug will be standardized for future reference and use.
- There will be exploration of the fundamental concept of *Agada* in Ayurveda.
- There will be standardization and validation of safety and efficacy of at least one *Agada* along with scientific exploration & operational research of herbo-mineral preparations (*Mritasanjeevana Agada*).
- Integrated approach of treatment involving Ayurveda and contemporary science which will establish the role of antidote in Ayurveda as alone or add on treatment in prevention & control of non-communicable but life threatening condition like poisoning.

IPR values: Probable mechanism of action of *Mritasanjeevana Agada* may be established and undertaken for copyright.

Translational Value: Further clinical study can be conducted to observe the efficacy of *Mritasanjeevana Agada* in human being.

Utilization of outcomes of project: If *Mritasanjeevana Agada* proves efficacious in animals, then clinical study can be conducted to observe its efficacy in human being. If it proves efficacious and safe in human being, thereafter it can be recommended to use in emergency medicine alone or as add on treatment to increase the survival rate of patients in all the cases of poisoning.

6. DISCUSSION

Mritasanjeevana Agada cures all types of poison, makes a person victorious. It revives a person who is apparently dead because of poisoning. It also cures fever. If it is inhaled, applied externally as an ointment, carried in the body as an amulet, smoked or kept in the house, it annihilates the afflictions by evil spirits, poisons, germs, sin, mantra, thunder-bolt and enemies. It counteracts the evil effects of bad dreams and stri-dosha (poisons secretly given by women). It prevents untimely death, fear of water and fear of thieves. It endows a person with wealth, food-grains and success in undertakings. It promotes auspiciousness, nourishment and longevity. *Mritasanjeevana Agada* is an excellent recipe helps in the revival of a dead person. This *agada* is indicated in 8th*vega* (Impulse) of *Visha* (poison) [8]. Acharya Sushruta has also mentioned similar *Agada* with the name *Sanjeevana Agada* to regain the life of dead person [9].

Agada is an antidote mentioned in Ayurvedic toxicology. It not only counteracts the action of poison but it also possesses the therapeutic efficacy. In the literature survey, some reviews are found on *Agada* [10] but a very few preclinical studies are found in the context of *Bilwadi Agada* [11] *Panchashirish Agada* [12], *Dashang Agada* [13], *Paravatadi Agada[14]* and *Maha Agada* [15]. Hence it is very necessary to standardize the Agada and to evaluate their safety and efficacy so that they can be used in the management of poisoning cases [16-19].

In the present scenario, as the death rates are increasing due to poisoning, *Mritasanjeevana Agada* may increase the survival time and survival rate of the poisoned patients. As the scientific research is not conducted to evaluate the efficacy of this ancient antidote, an experimental study is designed in animals with the intention to standardize the drug and to evaluate the efficacy of *Mritasanjeevana Agada* so that the evidences can be generated to use it in the emergency management of poisoning as an adjuvant therapy to increase the survival period of the patient which is a golden time for the treatment.

7. CONCLUSION

Mritasanjeevana agada may be as efficacious as Anti-snake venom as an antidote.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors

CONSENT

It is not applicable.

ETHICAL APPROVAL

The institutional animal ethics committee approval is received with Ref. No. DMIMS (DU)/IEAC/ 2019-20-09 dated: 30/09/2020

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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