"Experimental Study of Charkokta Hridayavarana Chikitsa with Madhu in Aconite Induced Cardiac Poisoning in Albino Mice"

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Abstract

Agadtantra is one of the very important branch of Asthang Ayurveda regarding to poisons. Death due to poisoning has been known since time immemorial. Poisoning is a major problem all over the world, although its type and the associated morbidity and mortality vary from country to country. The most common cause of death in poisoning cases are usually due to Cardiovascular and respiratory failure.Acharya Charack Has described 24 a upakramas (Treatments & Procedures) for vishakta Rogi . Hridayavana Chikitsa that is car diac protection one of them. Heart shouuld be protected first in all types of poisons. Here is the exprimental animal study was conducted to see the efficacy of hridayavaran chikitsta. Hridayavaran chikitsta is mentioned in all types of poisonig but in present study raw Vatsnabh kand churna and standard Acitnite was taken to induce cardiac poisonig and among the drugs mentioned for hridyavaran Madhu was selected. Criteria for assessment were toxic symptoms, blood pressure, survival time,haematology,biochemistry and histipathological examination of heart and aorta. There was reduction in toxic signs and symptoms of cardiac poisoning although they were not statistically significant. But there were statistically significant difference values in survival time. There were significant histopathologicl changes in myocardial muscles, coronary blood vessels and aorta.

Keywords: Hridyavaran chikitsa, Vatsanabh ,Madhu, cardiac poisoning

Introduction

Poisoning is major problem all over the world, although its types and the associated morbidity and mortality vary from country to country. The most common cause of death in poisoning is usually due to cardiovascular and respiratory failure. In Ayurveda aacharya Charka and Sushruta have given prime importance to protect heart in poisoning as after entering into body poison get situated in hridya. So while doing general line of treatment of poisoning if the hridyavaran chikitsa is done it is helpful. In this study attempt was done to see the efficacy of hridyavaran chikitsa. For this study experimental animal study was designed. Many drugs and combinations of drugs are given for hridyavaran. But Madhu is easily available and cost effective and a it is aahareey dravya may be given in more amount without any side effect by any non medico person who is present with that poisoned patient. So Madhu is selected for study. In any type of poisoning heart should be protected but Aconite poison which is Mahavisha and particularly acting on heart so it is chosen to induce poisoning in this study.

Primary objective

To study the cardioprotective activity of Madhu in Aconite induced cardiac poisoning in albino mice.

Secondary objectives

To review the literature about Hridyavaran according to Ayurvedic and modern aspect.

To Review the literature of Madhu Ayurvedic & modern aspect

To Review the literature of Aconite poison with Ayurvedic & modern aspects.

To study the cardio protective activity of Madhu in Aconite induced cardiac poisoning in Albino mice.

Hypothesis

Null hypothesis

Madhu has no cardioprotective activity of in Aconite induced cardiac poisoning in albino mice.

Alternative hypothesis

Madhu has cardioprotective activity of in Aconite induced cardiac poisoning in albino mice.

Materials and Methodology

MATERIALS :

Instruments and raw materials required for experiment were as follows:

A) Swiss Albino mice 54

B) (Ashodhaita) Vasthnabh kand churna.

C) Analytical standard Aconite (Aconitine)10 mg.

D) Madhu (honey)

Instruments for preparation of Vasthnabh kand churna:

Mortar and pestle (khalvayantra)

Airtight glass container.

Digital weighing machine

METHODOLOGY

Conceptual and literary review about hridayavarana, Vasthnabha,honey had been done.

Experimental animal study was designed and animal study was done in NTC,Pune. Prior animal ethics committee permission was taken.

Collection of raw materials

Ashodhaita vasthnabh kand 250 gm were purched from GMP certified company.

Prepration of vasthnabh kand churna :

Vastnabh kand were taken in laboratory of Rasashastra and Bhaishajya Kalpana department of our collge.

Raw vasthnabh kand grind well in mortar and pestle upto a fine powder,

When the mixture gets fine and dry then Weighted and filled in Airtight glass container.

Analytical standard 10mg aconite(Aconitine) was purchased from pharma company.

Madhu was purchased from GMP certified company.

Dosage selection and prepration

Sample of vasthnabha kand churna were stored at room temperature.

Sample of honey were stored at room temperature.

Sample of aonite(aconitin) freeze at below -20c. as per companys material Safety Data Sheet.

Animal study

Total 54 **Swiss** Albino mice are used.

24 animals were used for dose standardization and 30 animals for Efficacy study.

Inclusion criteria:

Wt - about 20.0 g to 25.0 gms.

Sex - Both male and female

Health-healthy mice selected.

Exclusion criteria

Unhealthy below weighted animals were not included in animal experiment.

Animal marking is done with the help of picric acid.

Body Weight:

Individual weights of animals were determined shortly before the test substance was administered.

Dose Standardization of Vatsanabh

Vatsanabh kand churna was dissolved in 5ml of distilled water given orally as per body weight of animals.

Dose : 2000 mg/kg

To determine the dose of Vatsanabh which shows mortality, three mice were administered orally 2000 mg/kg dose of Vatsanabh. All mice were found dead at the end of 15 min after Vatsanabh administration. Therefore lower dose of 300 mg/kg of Vatsanabh was selected and three mice were administered orally with it. As shown in result section all animals were found dead at the end of half an hour after Vatsanabh administration. On the basis of this, again the lower dose was selected and three animals were administered with 50 mg/kg of Vatsanabh. Although all these animals were survived they showed some signs of toxicity as shown in results.

Therefore, for efficacy study **150 mg/kg** dose of vatsanabh was selected.

Dose Standardization of Aconitine

Dissolvent for aconite: As the solvent for Aconitine, it was suspended in water and given orally as per body weight of animals.

Standardization of aconite

Dose 1 mg/kg

From above studies 2 mg/kg dose of Aconitine was selected for the efficacy study.

Madhu(honey):

Human Dose: 10-15 ml for healthy human
Conversion Factor: 0.0026
Absolute dose For 20 gm mice: 0.026 ml
Dose in mg/kg: 1.3ml/kg in mice

Honey was diluted in water and given orally as per body weight of animals.

Aministration of test article

The test article at the above concentration was administered to each mouse by **a single oral gavage**. The animals were dosed using a stainless steel intubation needle fitted onto a suitably graduated syringe. The dosage volume administered to individual mouse was adjusted according to its most recently recorded weight.

Procedure

Before starting animal experiment, the permission of incharge of institute was taken where the animal experiment was done.

Approval of Institutional Biosafety committee (IBSC) and Institutional Animal Ethics Committee

Grouping details of albino mice

30 albino mice of both sex weighing about 20.0 g to 25.0 gms were selected for study.

Each albino was weighed accurately and distributed equally in 5 groups.

After weighing the mice their hair was shaved on back region.

Group – I was kept on normal diet and habitat, neither envenomation nor drug administration was done to this group.

Group – II(Disease control 1) - Aconite

(Aconitine) , was suspended in water and given orally by single oral gavage. which fited with stainless steel intubation needle ,and suitably graduated syringe as, in the dose calculated per body weight of animals and appearance of toxic symptoms were observed and noted.

Group – III(Disease control 2)-

Ashodhita Vasthnabha kand churna was suspended in water and given orally ,by single oral gavage. which fited with stainless steel intubation needle ,and suitably graduated syringe as,in the dose calculated per body weight of animals as appearance of toxic symptoms were observed and noted.

Group – IV (Test control 1) –

Aconite+ Honey(1.3 ml/kg bw) given by given orally by single oral gavage. which fited with stainless steel intubation needle ,with suitably graduated 1 ml syringe as, the dose calculated per body weight of animals .

Group – V (Test control 2)

Ashodhita Vasthnabha kand churna + Honey(1.3 ml/kg bw) given orally by oral gavage as in dose calculated .

Table no 1 Grouping details

Group Distribution	Group (I)	Group (II)	Group (III)	Group (IV)	Group (V)
	Normal Control group	Disease control-1 (DC-1)	Disease control-2 (DC-2)	Test control-1	Test control-2
No. of Mice	6	6	6	6	6
Sex of	3 male	3 male	3 male	3 male	3 male
Mice	3 female	3 female	3 female	3 female	3 female
Weight	20.0 g to 25.0 g	20.0 g to 25.0 g	20.0 g to 25.0 g	20.0 g to 25.0 g	20.0 g to 25.0 g
Dosing	No treatment	Aconite induced cardiac poisoning	Ashodhita Vastsanaba kand churna induced cardiac poisonng	Aconite+ Honey(1.3 ml/kg bw)	Ashodhita Vastsanabh kand churna + Honey(1.3 ml/kg bw)
Route of administration of Drug		Given orally	Given orally	Given orally	Given orally
Period of Study	7 days	7 days	7 days	7 days	7 days

Duration of analysis:

Values are observed for 6-8 hrs by ½ an hourly.

Animals were observed individually after dosing at least once during the first 30 minutes, periodically during the first 24 hours, with special attention given during the first 4-6 hours. However, the duration of observation was not being fixed rigidly. All observations were systematically recorded with individual records being maintained for each animal in the daily observation record format.

Matching criteria

The parameters for observation of toxic symptoms is as follows:

- Irruglar Respiration — Increased Heart Rate(Tachycardia)
- Tremors — Loss of respiratry rate
- Heart rate(+,-) — Salivation
- Lacrimation — Irritation
- Convulsion — Depression
- Rectal bleeding — Nasal secreation
- Retinal hemorage — lethargy
- Seadition — Urination
- Hematuria — Coma

Blood pressure

Survival Time

Haematology : WBC, RBC

Biochemistry SGPT , CPKMB, SGOT , GLUCOSE

Histopathology

Duration of analysis:

Animals were observed individually after dosing at least once during the first 30 minutes, periodically during the first 24 hours, with special attention given during the first 4-6 hours. However, the duration of observation was not being fixed rigidly. All observations were systematically recorded with individual records being maintained for each animal in the daily observation record format.

Observations for appearance of toxic symptoms were noted in seconds and tabulated carefully as per relative groups. Grading was done as : (+: Low, ++: Moderate, +++: High)

Observations and Results

From present study it was observed that treatment has no effect on Trachycardia,on loss of RR,on heart rate and irregular respiration , no significant effect of madhu on Salivation,on Lacrimationon convulsions , no significant effect of madhu seen on Nasal secretion. The toxic symptoms Depression, Rectal bleeding, Retinal hemorage, Lethargy, Sedation, Urination, Hematuria, and Coma was not observed. All animals become restless and due to Increased irritability of animals ECG can not be recorded.

But there was statistical significant difference values in Survival time. There was reduction in toxic signs and symptoms of cardiac poisoning although they were not statistically significant. But the significant histopathological changes in myocardial muscles, coronary blood vessels and aorta. It was observed that Vatsanabh and Aconitine treated animals shown congested coronary blood vessels and moderate degen erative changes in myocardial muscles. It was also observed that there was discontinuation in muscle fibers of myocardium and pericardium. Further histopatholgical changes in aorta were observed, where Vatsnabh and Aconitine causes focal degenerative changes and vacuolar changes in aorta while treatment groups did not shown any changes in histo-architecture of aorta.

CONCLUSION

From the present study it can be concluded that Madhu (honey) is effective to prolong the survival time in Aconite Induced Cardiac Poisoning in albino mice. Hence the increased survival time can be used as golden period for cardiac resuccitation in poisoing.

Madhu prevents the significant histopathological changes in myocardial muscles, coronary blood vessels and aorta hence it can be concluded that it can be used effectively for hridyavaran chikitsa (cardioprotective drug) in poisoning.

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