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EXPERIMENTAL EVALUATION OF GRUHADOOMADI CHOORNAM WITH RESPECT TO SHOOLA AND ITS ANALGESIC PROPERTIES

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ABSTRACT
Choorna kalpana is an Upakalpana of Kalka kalpana in which the drugs are made into a fine powder. Gruhadoomadi choornam is one such Poly-herbal preparation having ingredients that are easily available at low cost and easy to prepare. This formulation is mentioned in arogyakalpadruma, shola roga. It is mainly indicated in the treatment of shoola, shopha. Shoola can be correlated to pain. pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of severe damage. The present study is to evaluate the analgesic effect of Gruhadoomadi Choornam on Wister Albino Rats.

KEYWORDS: Gruhadoomadi choornam, Analgesic, Wister albino rats.

INTRODUCTION

Aim of Ayurveda is to maintain the health of healthy persons and eradicate the disease of deceased persons.[1]

Pharmaceutical science is one of the aligned braches of science, which is closely associated with medical science.

It includes drug action processing, analysis & standardization.

The Indian Pharmaceutical science flourished and elegantly designed Panchavidha Kashaya kalpanas and Upakalpanas.

Choorna kalpana is the upakalpana of kalka kalpana.[2] Choorna is the fine powder of a completely dry drug, which is filtered through a clean cloth choorna's synonyms includes sushka kalka, sushka pisti, raja & kshoda.[3]

Gruhadoomadi choornam is a preparation mentioned in Arogyakalpadruma and is indicated in the management of shola,Shopha. Vataprakopa conditions.[4] It is given along with ushnajala internally. Shoola can be correlated with pain. pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of severe damage.[5] An experiment is a study that is designed to compare the benefits of an intervention with that of a standard treatment or without treatment. The present study is to evaluate the Analgesic property of Gruhadoomadi choornam in Wister Albino rats.

MATERIALS AND METHODS

An experiment is a study done to compare the benefits of any intervention with that of standard treatments or no treatment at all, like a new drug therapy or a prevention program, or to elicit the cause and the effect. Such a study is performed prospectively.[6]

Laboratory animals are used in experimental studies with animal models as models of humans or other species that are targets For the scientific evaluation of the analgesic property of the drug Gruhadoomadi choorna an animal experimental study is needed. Hence the present study has been undertaken to study the action of Gruhadoomadi choorna in selected Wistar albino rats by Eddy's Hot plate method, developed by Eddy and Leimbach (1953).

MATERIALS REQUIRED

Test drug-gruhadoomadi choorna
Standard drug – Diclofenac tab
Eddy's hot plate or Analgesiometer

Gastric catheter
Weighing machine
Gloves

A) Test Drugs

The Gruhadoomadi choorna was used for the present study. The drug Gruhadoomadii choorna was prepared. All the ingredient are taken in equal quantity and powdered well.

B) Dose selection

The dose selection was done on the basis of body surface area ratio using the table of Paget and Barnes(1964 cited by Gosh;1984) .It was done as follows.
Human dose X surface area ratio convertibility factor for rat or mouse as required.
Conversion of the dose obtained above to dose in mg or g/kg by multiplying with suitable factor based on the average weight of the animal.

Dose for rats

Dose of Gruhadoomadi Choorna

Human dose X 0.018 for rat weighing 200g
ie. 12gmX 0.018 = 0.216
Conversion to dose/kg body wt. =0.216X5-1.08gm/kg =1.008mg/gm, along with ushnajala.
Dose of Standard drug :diclofenac
50mg/kg body wt.

C) Rout of drug administration

The test drugs were administered according to the body weight of the animal by oral route with the help of gastric catheter.

D) Animals

Charles Foster strain albino male rats weighing between 100- 190 g and were used for experimental study with the following conditions.

- They were exposed to natural day and night cycles with ideal laboratory condition in terms of ambient temperature, humidity.
- They were fed with Amrut brand rat pellet feed supplied by Pranav Agro Industries and tap water ad libitum. The experiments were carried out after obtaining the permission of the Institute's Ethics committee.

E) Grouping

The rats were grouped into three groups with 6 animals in each group.
Group I: (Normal Control)
Rats in this group were given distilled water in volume equal to the volume of drug s administered in test drug administered groups
Dose: 5 ml/kg.

Dosing details of control group:

Table No.1: Table showing dosing details of control group.

SI.NO	MARKS	WEIGHT OF RATS
1	Head	126g
2.	Neck	138g
3.	Body	100g
4.	Tail	134g
5.	Forelimb	115g
6.	No mark	116g

Group II: (Standard)
Given diclofenac tab for 3 days
Dose-0.01 mg/g

Dosing details of control group:

Table No.2: Table showing dosing getails of standard group.

SI.NO	MARKS	WEIGHT OF RATS	DOSING DETAILS
1	Head	105g	0.21 with 20 ml distilled water
2.	Neck	125g	0.25ml
3.	Body	114g	0.22ml
4.	Tail	127g	0.25ml
5.	Forelimb	117g	0.23ml
6.	No mark	101g	0.20ml

Group-III (Test Group)
Gruhadoomadi choorna in kwatha form for 7 days.
Dose-108mg/ml

Dosing details of control group

Table No.3: Table showing dosing getails of test group.

SI.NO	MARKS	WEIGHT OF RATS	DOSING DETAILS
1	Head	143g	1.43ml
2.	Neck	151g	1.51ml
3.	Body	140g	1.4ml
4.	Tail	158g	1.58ml
5.	Forelimb	164g	1.64ml
6.	No mark	143g	1.43ml

Drug administration

Control and test drug were administered seven days in morning session between 10 AM orally.

Statistical Analysis

The data generated during the study have been interpreted by calculating the difference between different groups by ANOVA TEST

Animal selection
18 healthy Wister albino rats were selected and divided into three groups.

Inclusion criteria
1. Healthy albino rats of either sex
2. Albino rats weighing between 100-190gm.

Exclusion criteria
1. Albino rats which are infected.
2. Albino rats which are pregnant.
3. Albino rats under other experiments.

Rat maintenance
18 Wistar albino rats were selected and made into three groups and kept in clean cages.
Paddy husk bedding was provided in the cages.

Examination of the animal prior to the experiment
All the Wistar albino rats were subjected to general check-up for weight.
Weight of each animal was checked by using spring balance.
Each rat was identified by the colouring in body by picric acid.
The cages were labelled with name of the group and drug.

Duration
The above scheduled drugs were administered for 15 days.

Procedure
18 healthy Wistar albino rats of either sex was selected randomly and grouped into three groups having 6 rats. Rats were kept in separate cages. They were numbered for their individual identification.

The Basal Reaction Time of each animal was noted using stop watch after placing the rats on the hot plate on which the temperature was maintained at 550C. The rats were removed from hot plate by taking of the lid immediately when the paw licking or jump response was observed. These observations was taken for each animal and the mean value was noted. This reading was taken as Basal Reaction Time.

The trial and standard drug were given orally and the reaction time were noted at initialy and after 1,2,3,4,24 hrs.

OBSERVATIONS AND RESULTS
The experimental data were expressed as Mean ±SEM. The data was analysed by one way Anova followed by Dunnet multiple t as post Hoc test for determining the level of significance of the observed. A 'p' value of less than 0.05 was considered statistically significant. Graph pad in Stat – 3 software was used for statistical analysis of the generated data. The effect of test drug on jumping or tail licking noted initialy, and after 1,2,3,4,24 hrs.

The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at different time interval as follows,

A) Initial

Table No. 4: The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at initial.

GROUP	Mean ±SEMInitial Pain Threshold	% Change
Control	3.98±0.45	--
Standard	4.18±0.68	5.02↑
Test group	4.61±0.64	95.39↑

Data : MEAN ± SEM
The data shows there was increase in pain threshold in initial in standard group and test group when compare to control group, the observation increase was found to be statistically non significant

B)1 hr after

Table No. 5: The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at 1 hr after.

GROUP	Mean±SEM Pain Threshold in 1 hr	% Change
Control	3.55±0.56	--
Standard	2.83±0.61	20.28↓
Test group	2.75±0.39	22.53↓

Data: MEAN ± SEM
p>0.05 in comparison to control group.

The data shows there was increase in pain threshold in initial in standard group and test group when compare to control group, the observation increase was found to be statistically non significant

C) After 2 Hrs

Table No. 6: The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at 2hrs after.

GROUP	Mean±SEM Pain Threshold in 2 hrs	% Change
Control	2.49±0.30	--
Standard	4.51±0.76	81.12↑
Test group	6.04±0.85**	142.57↑

Data: MEAN ± SEM,**P<0.01,**P<0.01 in comparison to control group.

The data shows there was increase in pain threshold in initial in standard group when compare to control group, the observation increase was found to be statistically non significant.

The data shows there was increase in pain threshold in initial in test group when compare to control group, the observation increase was found to be statistically very significant.

D) After 3 Hrs

TABLE NO. 7: The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at 3 hrs after.

GROUP	Mean±SEM Pain Threshold in 3 hrs	% Change9
Control	2.94±0.63	--
Standard	4.84±0.94	64.62↑
test group	3.71±0.34	26.19↑

Data : MEAN ± SEM

P>0.05 in comparison to control group.

The data shows there was increase in pain threshold in initial in standard group and test group when compare to control group, the observation increase was found to be statistically non significant.

E) After 4hrs

Table No: 8: The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at 4 hrs after.

GROUP	Mean±SEM Pain Threshold in 4 hrs	% Change
Control	2.36±0.42	--
Standard	4.23±0.27	79.23↑
Test group	3.29±0.48	39.40↑

Data: MEAN ± SEM

P>0.05 in comparison to control group.

The data shows there was increase in pain threshold in initial in standard group and test group when compare to control group, the observation increase was found to be statistically non significant.

F) After 24 Hrs

Table No. 9: The effect of Gruhadhoomadi choorna on paw lick/jump response on percentage change at 24 hrs after.

GROUP	Mean±SEM Pain Threshold in 24 hrs	% Change
Control	1.34±0.03	--
Standard	3.98±.09**	197.01↑
Test group	2.87±0.36**	114.17↑

Data: MEAN ± SEM,**P<0.01,*

The data shows there was increase in pain threshold in initial in standard group and test group when compare to control group, the observation increase was found to be statistically very significant

The data shows there was increase in pain threshold in initial in control group when compare to standard group, the observation increase was found to be statistically non significant

*P<0.01 in comparison to control group.

DISCUSSION

The study was conducted to evaluate the analgesic property of gruhadoomadi choornam. For this, the study model was Eddy's hot plate method. The choornam was subjected to invivo animal (per se) for an experimental module of analgesic effect in Wistar Albino rat paw. Experimental data was analyzed using ANOVA followed by Dunnet multiple t-test as There was increase in pain threshold in initial in standard group and test group when compare to control group, the observation increase was found to be statistically non significant, was increase in pain threshold at 1 hr in standard group and test group when compare to control group, the observation increase was found to be statistically non significant, and there was increase in pain threshold at 2hrs in standard group when compare to control group, the observation increase was found to be statistically non significant, where as the data shows there was increase in pain threshold in initial in test group when compare to control group, the observation increase was found to be statistically very significant.

There was increase in pain threshold at 3 hrs and at 4 hrs in standard group and test group when compare to control group, the observation increase was found to be statistically non significant. there was increase in pain threshold in at 24 hrs, in standard group and test group when compare to control group, the observation increase was found to be statistically very significant and the data shows increase in pain threshold at 24 hrs in control group when compare to standard group, the observation increase was found to be statistically non significant.

The values of both trial and standard become almost same so there was no statistical difference. At 24hrs the effect of the standard drug kept decreasing while the effect of trial drug kept gradually increasing. So there was statistically significant difference at 24 hrs.

Thus it can be observed that Gruhadoomadi choornam exhibits good analgesic properties.

CONCLUSION

Experimental study of Gruhadoomadi choorna with ushnajala revealed statistically significant. The trial drug Gruhadoomadi choorna was found to be significantly effective and having sustained effect during the study which includes protocol of the study, dose fixation for Albino rats and observations by statistical analysis on analgesic effect of gruhadoomadi choornam .and it has shown good Analgesic properties.

Limitations of the study

It is a time bound study. Specific instrumentation and technological accreditation taken from outside laboratories. Experimental model size was small to draw a generalized conclusion.

Scope of the study

Long term effect of drug can be studied.Further Clinical trials with respect to analgesic activity can be done. New dosage form making pill out of it, standardization and evaluation of clinical effect can be done.

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