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AN EXPERIMENTAL EVALUATION OF *CAESALPINIA BONDUCELLA* ROXB FOR ITS VEDANASTHAPANA (ANALGESIC) PROPERTY

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ABSTRACT
Vedanasthapana are the drugs which are used to remove the unpleasant sensation of a particular part of the body and which restores the normal state. The objective of the study was to evaluate the Vedanasthapana (Analgesic) property of the drug Latakaranja in experimental animal. The experimental study was under taken with 18 Albino mice of both sexes. Three groups had been taken for the study containing 6 albino mice in each group. The trial drug is Latakaranja beeja in the form of Kwatha. Eddy's Hot plate method had been adopted to carry out the Vedanasthapana effect of the trial drug.
KEYWORDS: Latakaranja, *Caesalpinia bonducella* Roxb, Vedanasthapana, Analgesic effect, Experimental study, Eddy's Hot plate.

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INTRODUCTION

Latakaranja (*Caesalpinia bonducella* Roxb.) is a medicinal plant found throughout the hotter parts of India commonly in West Bengal and South India[1]. According to Ayurvedic Classics the drug Latakaranja has got different action on disease like Jwara, Madhumeha etc[2]. It is observed that in Villages of Idukki District, Kerala the seeds of this plant is used internally and externally for painful conditions like low backache effectively. Even though there are a good number of anti inflammatory and analgesic drugs like NSAID and steroidal type which gives quick relief from the ailments produces undesired effect on prolonged therapeutic usage. Increasing the quantity of adverse effects of synthetic products especially among the Analgesic drugs is a burning issue[3]. In today's scientific era, time has come to prove the Ayurvedic concepts and efficacy of the Ayurvedic drugs on the various diseases by applying all the modern parameters. The drug which helps to control the pain thus to establish a normal sensation is the principle behind the scope of this experimental study.

MATERIALS AND METHODS

Selection of Animals

Albino mice were used as experimental model in this study. The reason for selecting Albino mice is that, they are more sensitive to heat sensation. Albino mice of either sex weighing between 20-25gm were selected for the study. They were housed individually in polypropylene cages in well-ventilated rooms. 18 healthy albino mice were selected and grouped into three.

Grouping

Group 1 kept as Control (Distilled water) and Group 2 as Standard (Ibu brufen) and Group 3 Trial drug (Latakaranja beeja) in the form of Kwatha has been used for the study.

Method

Hot plate method using Analgesiometer, developed by Eddy and Leimbach (1953) was adopted.

Method of preparation of Latakaranja Beeja Kwatha

The Kwatha was prepared at the Pharmacy. The Latakaranja Beeja made in to Yavakuta churna. Then 1 part of drug was taken in to a vessel and 16 part of water is added and was heated over Mandagni, reduced to 1/8 quantity and filtered with clean cloth[4].

Dose fixing

It was done based on the Paget Barner table in which adult dose was multiplied by mice factor (0.0026) hence dose of mice =0.0026 x 50 x Human dose

The trial drug (Latakaranja beeja Kwatha), and the standard drug (Ibu brufen) was administered orally. The dose fixed as 0.0026 x 50 x Human dose. i.e 0.0026 x 50

x 96ml = 12.48 ml/kg body weight. So 12.48 x 20 (mice weight in gram.) /1000 = 0.24ml (Ref:M.V.Ghosh-Fundamentals of Experimental Pharmacology Second Edition 1984 p.153)

Mode of Administration of the drug

Known quantity of the Kwatha was taken in 1ml disposable Insulin syringe fitted with infant feeding tube and pushed directly in to the stomach of the mice after inserting the infant feeding tube into the esophagus carefully.

Procedure

18 healthy Albino mice of either sex were selected randomly and three groups having 6 albino mice were kept in separate cages. They were numbered for their individual identification.

The Basal Reaction Time of each animal was noted using a stop watch after placing the mice on the Hot- plate on which the temperature was maintained at (55^0C). The mice were removed from Hot- plate immediately by taking off the lid when the paw licking or jump response was observed. These observations were made for each animal and the mean was taken. This reading is considered as Basal Reaction Time.

The corresponding drugs were given orally and the reaction time was noted at regular intervals at 15^{th}, 30^{th}, 60^{th}, 120^{th} and 180^{th} minute in each group. In Group 1 distilled water is given and the pain threshold is observed at different intervals (15^{th}, 30^{th} 60^{th}, 120^{th} and 180^{th} min. In Group 2 standard drug is given and in Group 3 Trial drug is given and the pain threshold was observed.

RESULT

The statistical results on paired t test shows that both the trial drug and standard drug is not significant at 15^{th} minute and at 30^{th} minute standard is highly significant but the trial drug is not significant. At 60^{th} min both the trial drug and standard drug shows highly significant result. At 120^{th} min both the trial drug and standard drug are moderately significant. At 180^{th} min the standard drug is insignificant while the trial drug shows significant Analgesic action

DISCUSSION

All the 3 groups on ANOVA test where statistically significant at 30^{th}, 60^{th}, 120^{th} and 180^{th} minute[5]. The result shows that absorption of standard drug is faster comparing to the Ayurvedic compound Latakaranja Beeja Kwatha. Here the standard drug (Ibu brufen) showed significant action at 30^{th} min onwards, and the trial drug (Kwatha) showed significant action from 60^{th} min onwards. But its action last at 180^{th} min where the standard is insignificant in Analgesic action. Thus the trial drug has lasting effect than the standard.

CONCLUSION

The present study aims at providing a scientific view to the folklore claim. The identity of the drug was confirmed macroscopically and microscopically through the pharmacognostic study. Through the preliminary phytochemistry the detection of proteins, tri terpanoids, alkaloids, tannin, flavanoid, phenol, carbohydrates etc carried out. The essential aminoacids such as Crystine found out through the chromatographic methods. On the experiment study, by following the protocol the trial drug showed significant analgesic action comparing to the standard and the control group.

On the basis of this study it is concluded that the Ayurvedic compound will act for more duration comparing to the standard drug (Ibu brufen). Effective formulations can be prepared by using this drug as Ayurvedic Analgesics. To prove the efficacy on this experimental study a well planned clinical evaluation may be followed.

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Table 1 ANOVA test showing significant difference between the groups (Control group, Standard and Trial drug)

Time	Source of variation	Sum of squares	Df	Mean of sum of squares	F ratio	F value
15th minute	**Between**	0.3185	2	0.1593	1.960	3.68
	Error	1.219	15	8.1251		
	Total	1.537	17			
30th minute	**Between**	14.69	2	7.347	51.69	
	Error	2.132	15	0.1421		
	Total	16.83	17			
60th minute	**Between**	19.76	2	9.879	68.97	
	Error	2.149	15	0.1432		
	Total	21.91	17			
120th minute	**Between**	3.156	2	1.578	8.651	
	Error	2.736	15	0.1824		
	Total	5.892	17			
180th minute	**Between**	1.131	2	0.5653	1.934	
	Error	4.384	15	0.2923		
	Total	5.515	17			

Table F value for 2df across and 15df vertically at 5% level of significance = 3.68. Since the computed F ratio is greater than the table F value, at 30th,60th and 120th minute so the pain threshold of the three groups differ significantly.

Table 2 Showing the pain threshold observed at different intervals for Control group

Sl. No.	Pain threshold in sec.					Mean
	15th min	**30th min**	**60th min**	**120th min**	**180thmin**	
1	2.15	3.12	2.32	2.47	2.9	2.59
2	2.28	3.07	2.05	3.06	1.8	2.45
3	2.05	2.38	2.43	2.31	2.41	2.31
4	2.40	2.65	2.71	2.06	3.21	2.60
5	2.03	2.05	2.37	2.42	2.3	2.23
6	2.17	1.9	2.51	3.00	2.41	2.39

Table 3 Showing the pain threshold observed at different intervals in Standard Drug

Sl. No.	Pain threshold in sec.					Mean
	15th min	**30th min**	**60th min**	**120th min**	**180thmin**	
1	2.4	4.23	4.89	3.2	2.12	3.36
2	2.8	4.43	4.66	3.61	2.15	3.53
3	2.6	4.58	5.09	4	3.22	3.89
4	2.7	4.08	5.27	2.87	3.72	3.72
5	1.9	5.17	4.53	3.46	3	3.61
6	2.43	4.22	5.2	2.9	3.01	3.55

Table 4 Showing the pain threshold observed at different intervals in Trial drug Latakaranja Beeja Kwatha

Sl. No.	Pain threshold in sec.					Mean
	15th min	**30th min**	**60th min**	**120th min**	**180thmin**	
1	2.46	2.46	3.30	3	2.78	2.8
2	2.30	2.71	3.76	2.96	2.6	2.86
3	3.07	2.48	4.89	3.8	3.01	3.45
4	2.43	2.51	4.16	4.06	3.99	3.43
5	2	2.46	4.06	3.72	3.32	3.11
6	2.45	2.63	3.69	3.56	2.99	3.06

Table 5 Comparative effect of the Trial drug and Standard drug before treatment and after treatment at 15th, 30th, 60th, 120th, and 180th minute:

Time	P value of Trial drug	P value of Standard drug
15th min	P>0.10 = Insignificant	P>0.10 = Insignificant
30th min	P<0.10 = Insignificant	P <0.001 = Highly significant
60th min	P<0.001 = Highly significant	P<0.001 = Highly significant
120thmin	P<0.01= Moderately significant	P<0.01 = Moderately significant
180thmin	P<0.05 = Significant	P>0.10 = Insignificant

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