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Antipyretic Study of *Jwarahara Kashaya Choorna* & It's *Ghana* Vati in Wistar Albino Rats

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ABSTRACT

The present pharmacological investigation was undertaken to study the anti-pyretic activity of *Jwarahara Kashaya Choorna & Ghana Vati* in Albino rats against yeast induced pyrexia. Standard drug was Paracetamol (PCM). The antipyretic study was screened by using Brewer's yeast induced pyrexia method. Thirty Albino rats of either sex were selected and equally divided into 5 groups. Room temperature was maintained at constant temperature of 24-25 0C for 24 hours before experimental study. Before inducing pyrexia, initial rectal temperature was recorded individually. Pyrexia was induced by subcutaneous injection of 1ml/100 mg body wt. of 20% Brewer's yeast suspension in 0.9% normal saline. The data generated during study shows that *Jwarahara Kashaya Choorna & Ghana Vati* ishaving significant anti-pyretic activity.

KEYWORDS

Jwarahara, Ghana Vati, Pyrexia, Brewer's Yeast, Paracetamol (PCM)

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INTRODUCTION

Animal experiments have played a vital role in advancing our knowledge of human and animal biology. In ~~our~~Ayurvedic literature, numbers of references are available regarding the testing of the drug and food on animal for evaluating their safety before administration to the human beings. In *Charaka Samhita* numerous references find their way to describe these procedures e.g. *Siddhi Sthana Adhyaya.*[1] In the present study the aim was to undertake a comparative experimental Evaluation to established anti-pyretic activity of two sample of *Jwarahara Kashaya Choorna*[2] *& Ghana Vati*. Main aim of this study was to determine which formulation of the *Jwarahara Kashaya* would be therapeutically effective for in the treatment of *jwara* (Fever).

AIMS AND OBJECTIVES

(1)To compare the efficacy of formulations *Jwarahara Kashaya* and its *Ghana Vati*.

(2) To evaluate the test drugs for their anti - pyretic effect.

(3) To compare the anti-pyretic effect of test drug (JK) with standard drug Paracetamol (PCM).

MATERIALS AND METHODS

Animals

Wistar strain albino rats of either sex weighing between 140–160 g were used. The animals were obtained from the animal house attached to the pharmacology laboratory of BilwalMedchem and Research Laboratory Pvt Ltd, H-9 SKS (Ext.) Reengus, RIICO Industrial Area, Reengus, Sikar, Rajasthan. The rats were exposed to natural day and night cycles under ideal ambient laboratory conditions (temperature 22±3°C and humidity 50%–60%). They were fed with Gulmohar brand animal feed manufactured by Lipton India Limited. Food and water were provided libitum.

The experiments were carried out after obtaining permission from the institutional animal ethics committee (Approval number – BMRL/AD/CPCSEA/IAEC/2019/10/7)

Administration of dos

Calculated dose had been administered orally with help of oral feeding needle after inducing pyrexia.

Experimental Design:

Thirty healthy Wistar Albino rats were divided in 5 groups. Each group had 6 rats.

Group A (Normal Control) had 6 healthy rats and had received distilled water 5 ml/kg per oral.

Group B (Induced Control) had 6 Pyrexia Induced rats and had received Distilled water 5 ml/kg per oral.

Group C (Test Group I) had 6 Pyrexia Induced rats and had received *JwaraharaKashaya10* ml/kg per oral.

Group D (Test Group II) had 6 Pyrexia Induced rats and had received *Jwarahara Ghan Vati* 200 mg/kg per oral.

Group E (Standard Group) had 6 Pyrexia Induced rats and had received Standard Drug Paracetamol 50 mg/kg per oral.

Standardization of yeast-induced antipyretic model for the present study:

Pyrexia was induced by subcutaneous injection of 20% w/v of brewer's yeast (10ml/kg) in distilled water. Basal rectal temperature was measured before the injection of yeast, by digital thermometer. The rise in temperature was recorded 18 h after yeast injection.

Statistical analysis:

The results are expressed as Mean ± SEM Comparison between each hr. and each group were performed by analysis of variance (Two Way ANOVA). In all tests the criterion for statistical significance was $P < 0.05$

RESULTS

Table 1 Statically Analysis of Normal Control, Induced Control, Test Group 1, 2 & Standard Group (TWO Way ANOVA)

Dunnett's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
Before inducing Fever					
Group B vs. Group A	-0.1	-1.074 to 0.8736	No	ns	0.9971
Group B vs. Group C	-0.05	-1.024 to 0.9236	No	ns	0.9998
Group B vs. Group D	0.1167	-0.857 to 1.09	No	ns	0.9950
Group B vs. Group E	-0.5167	-1.49 to 0.457	No	ns	0.4946
0 hr					
Group B vs. Group A	3.917	2.943 to 4.89	Yes	****	0.0001
Group B vs. Group C	0.15	-0.8236 to 1.124	No	ns	0.9870
Group B vs. Group D	0.3333	-0.6403 to 1.307	No	ns	0.8146
Group B vs. Group E	0.35	-0.6236 to 1.324	No	ns	0.7884
1 hr					
Group B vs. Group A	4.417	3.443 to 5.39	Yes	****	0.0001
Group B vs. Group C	1.8	0.8264 to 2.774	Yes	****	0.0001
Group B vs. Group D	1.283	0.3097 to 2.257	Yes	**	0.0051
Group B vs. Group E	2.55	1.576 to 3.524	Yes	****	0.0001
2 hr					
Group B vs. Group A	5.283	4.31 to 6.257	Yes	****	0.0001
Group B vs. Group C	2.283	1.31 to 3.257	Yes	****	0.0001
Group B vs. Group D	3.35	2.376 to 4.324	Yes	****	0.0001
Group B vs. Group E	3.067	2.093 to 4.04	Yes	****	0.0001
3 hr					
Group B vs. Group A	4.067	3.093 to 5.04	Yes	****	0.0001
Group B vs. Group C	1.433	0.4597 to 2.407	Yes	**	0.0014
Group B vs. Group D	2.1	1.126 to 3.074	Yes	****	0.0001
Group B vs. Group E	2.317	1.343 to 3.29	Yes	****	0.0001
4 hr					
Group B vs. Group A	4.783	3.81 to 5.757	Yes	****	0.0001
Group B vs. Group C	1.533	0.5597 to 2.507	Yes	***	0.0006

Group B vs. Group D	1.75	0.7764 to 2.724	Yes	****	0.0001
Group B vs. Group E	2.483	1.51 to 3.457	Yes	****	0.0001
5 hr					
Group B vs. Group A	3.367	2.393 to 4.34	Yes	****	0.0001
Group B vs. Group C	-0.2333	-1.207 to 0.7403	No	ns	0.9380
Group B vs. Group D	0.8333	-0.1403 to 1.807	No	ns	0.1163
Group B vs. Group E	1.25	0.2764 to 2.224	Yes	**	0.0067
6 hr					
Group B vs. Group A	2.9	1.926 to 3.874	Yes	****	0.0001
Group B vs. Group C	0.01666	-0.957 to 0.9903	No	ns	0.9999
Group B vs. Group D	0.6833	-0.2903 to 1.657	No	ns	0.2505
Group B vs. Group E	1.117	0.143 to 2.09	Yes	*	0.0187

DISCUSSION

Fever is a surrogate marker for disease activity in many infectious and inflammatory disorders. According to the classical view, the genesis of fever is induced by inflammatory mediators (i.e., cytokines, namely interleukin-1, interleukin-6, tumor necrosis factor, and others) that are predominantly released by activated peripheral mononuclear phagocytes and other immune cells[3,4].

Paracetamol is an analgesic but is also an effective febrifuge. It is a poor inhibitor of cyclooxygenase in the presence of peroxides that are found in inflammatory lesions. In contrast, its antipyretic effect may be explained by its ability to inhibit cyclooxygenase in the brain, where peroxide tone is low. Further, it does not inhibit neutrophil activation. In supra-pharmacologic doses it inhibits NF-kB stimulation of inducible nitric oxide synthase[5]. In the present study, thirty healthy Albino Wistar rats were used for this study. 20% w/v of Brewer's yeast (10ml/kg) was used for inducing of Pyrexia in all thirty rats. Rectal temperature were recorded with help of digital thermometer. Before initiation of experiment rectal temperature was recorded in all groups and after that subcutaneous injection of yeast was administered for inducing pyrexia and after 18 hour of yeast administration distilled water and test samples in all group was orally administered and rectal temperature was recorded for 0 , 1, 2, 3, 4, 5 and 6th hour.

It was observed that:

1. Rectal temperature was statically increased in all Groups after 18th hour in all Groups (Group B, C, D and E)

2. Statistical comparison of Group B verses Group C, D and E at 1st hour observation there was statically significant temperature reduction found in Group C, Group D and Group E (*P value = 0.0001, 0.0051, 0.0001*).

3. Statisticalcomparisonof Group B verses Group C, D and E at 2nd hour observation

showed that there was statically significant temperature reduction in Group C, Group D and Group E (*P value = 0.0001*).

4. Statisticalcomparison of Group B verses Group C, D and E at 3rd hour observation there was statically significant temperature reduction found in Group C, Group D and Group E (*P value = 0.0014, 0.0001, 0.0001*).

5. Statistical comparison of Group B verses Group C, D and E at 4th hour observation there wasstatically significant temperature reduction foundin Group C, Group D and Group E (*P value = 0.0006, 0.0001, 0.0001*).

6. Statistical comparison of Group B verses Group C, D and E at 5st hour observation there was no statically significant temperature reduction found in Group C and Group D. Statically significant temperature reduction was found in Group E (*P value = 0.0067*).

7. Statistical comparison of Group B verses Group C, D and E at 6st hour observation there was no statically significant temperature reduction found in Group C and Group D. Statically significant temperature reduction was found in Group E (*P value = 0.0187*).

CONCLUSION

Jwarahara kashaya is a well known formulation used in fever and other infectious conditions since very long time.. How everin order to generate evidence base for the same the present study was undertaken to evaluate the antipyretic activity of *Jwarahara Kwatha Choorna* and *Ghan Vati*. Study revealed that both *Kwatha* Choorna and *Ghana* showed significant reduction is temperature after 4 hours of induction of pyrexia. However, the results were non significant when compared at the sixth hour.

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