

EXPERIMENTAL STUDY ON ALBINO RATS W.S.R. TO ANTIPYRETIC EFFECT OF TWO VARIETIES OF *PARPATAKA***Varshney Pallavi¹ Swastik Suresh²**

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ABSTRACT

Man has always been in search of a healthy and happy life. With the advancement in science he is searching for easily available and cost effective drugs to maintain health and to treat disorders so that they do not create havoc amongst people. For the fulfillment of these objectives drugs mentioned in our classics should be subjected to the rigorous process of experimentation so that they can be introduced in our society. From amongst all diseases fever or *jwara* is the most common disease and symptom of disease. Human clinical trials are not directly allowed before undergoing animal experimentation. As *Parpataka* is well known as an anti-pyretic drug, so in the present study the *kwatha* (decoction) of two varieties of *Parpataka* were administered to albino rats in whom pyrexia had been artificially produced to find out which showed better results in the reduction of elevated temperature which is the main feature of pyrexia.

Keywords: Health, fever, *jwara* , animal experimentation, albino rats

INTRODUCTION:

Man is regarded as the supreme of all the other creatures and is continuously working for the betterment of other beings. For this purpose drugs are being continually searched and tested. Since the time of our ancient *Acharyas* animals are being used for the purpose of animal experimentation. Since it is not safe to use a new drug on humans for the purpose of testing its efficacy certain animals which are having similarity in structures and functions to human body, form the basis of experiments conducted for

human welfare. The research is conducted inside universities, medical schools, pharmaceutical companies, farms, defense establishments, and commercial facilities that provide animal-testing services to industry. It is not always possible to produce the same aetiopathological events that occur in human i.e. vitiation of *dosha* , *dhatu* and *mala* in animals, but pathological conditions as pyrexia, inflammation and wounds are induced in animals to confirm drug efficacy in their treatment.

AIM OF STUDY: To experimentally evaluate and compare the *Jwaraghna* (antipyretic property) of two varieties of *Parpataka*-*Oldenlandia corymbosa* and *Fumaria indica panchanga kwatha* in Albino rats where pyrexia has been induced by administering yeast.

MATERIALS & METHODS:

Digital Thermometer: It was thermo sensitive and had digital display screen for displaying temperature in Fahrenheit Scale.

Brewer's Yeast (Bakers Yeast)

Paracetamol: Calpol suspension was purchased. Referring the human dose concentration of the suspension, rat dose is fixed as 0.75ml/100g. Body weight

Selection Of Experimental Model:

Mice and rats are the most commonly used vertebrate species because of their size, low cost, ease of handling, and fast reproduction rate.^{15,16}. For the study 24 healthy Wister rats of either sex (selected randomly) weighing between 150 – 200 gms were procured. They were maintained in standard laboratory conditions. Rats were divided into 4 groups of 6 rats each. Pyrexia was induced in them, thereafter they were administered drugs as: CG -Control Group (Distilled water), SG- Standard Group (Paracetamol suspension), TG1- Trial Group1 (*Kwatha* of *Oldenlandia corymbosa*), TG2-Trial Group2 (*Kwatha* of *Fumaria indica*)

Animal Selection Criteria:

Inclusion criteria: 150-200gms. Wister rats Male and Female Active and healthy rats thermometer. This provided the initial reading. After recording the initial reading the fever was induced to all rats, by injecting

Exclusion criteria: Below 150gms and above 200gms Diseased rats and Rats already used for other experiments

Rat Maintenance: All animals were maintained in the Animal House under identical condition of place light, temperature, food and other condition. 4 cages used for the experiment were cleaned with detergent followed by disinfectant phenol solution before the commencement of the experiment, and once in 3 days and there after till the end of experiment. The bedding material was prepared using paddy husk and it was changed once in 3 days till the end of experiment.

Feeding Schedule : 15 – 20 grams/day of food was provided and water as required.

Method For Inducing Pyrexia In Animals:

This is done by the Yeast induced method. This method is explained by Gujral et al 1955 also by Poonam et al 1989. In this procedure Brewer's yeast, is used as a pyrogen. 20 g. of collected sample of Bakers yeast is taken in a conical flask and dissolved in 100ml of 0.9% of normal saline by constant stirring with a glass rod. In this way 20% of yeast solution is prepared which is given subcutaneously with the dose of 1 ml/100gm of body weight. which induces pyrexia in 1 hr. this method can be adopted if the experimental animals are Albino rats.

Procedure of inducing pyrexia in Rats:

The rats were kept under fasting for 18 hrs prior to the commencement of the experiment. They were provided with water. Next day rectal temperatures of all rats were recorded with digital 20% of Brewer's yeast subcutaneously on the thigh region in the

dose of 1ml/100gm body weight. After inducing fever again the rectal temperature of each rat was noted to confirm the pyrexia. 1 hr after recording these temperatures corresponding medicine was administered to all groups. Rats of CG i.e. G1 were provided with Distilled water. Rats of SG i.e. G2 were fed with Paracetamol suspension using feeding syringe in a dose of 4.5ml/kg body weight. Rats of TG1 i.e. G3 are fed with Oldenlandia corymbosa Kwatha using feeding syringe, in a dose of 4.5ml./kg body weight. Rats of TG 2 i.e. G4 are fed with Fumaria indica Kwatha using a feeding syringe in a dose of 4.5ml/kg body weight. After inducing pyrexia and administration of

medicine rectal temperature has taken successively for 14 hrs.

Mode Of Administration

Administration of drugs through intra-gastric tube using 2ml disposable syringe fitted with 20 gauze stainless steel needle provided with suitable smooth malleable plastic catheter was used for drug administration to avoid injury to the oesophagus of rat.

Calculation Of Dose: Recommended human dose of *Kwatha* according to Ayurvedic classic is 1 *Pala* (48ml). This dose is converted in to rat dose by using the formula.

Rat dose= Human dose × 0.018/200g of body weight = 4.5ml/kg body weight

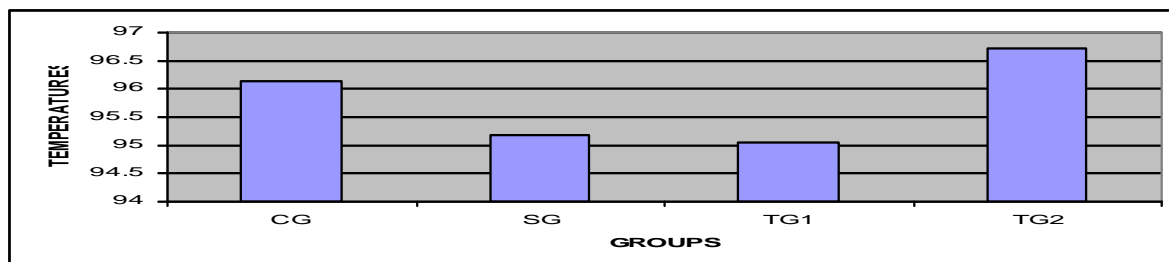
RESULTS: Showing Behavioral Changes of Rats

Before induction of Pyrexia	After induction of Pyrexia
Normal body temperature	Raised body temperature even felt with Touch
More active	Activeness was decreased.
Behavior – Normal with good food & Water intake.	Behavior - Face bent down wards - looking tired - Scanty urination - Less water intake - Trying to sleep one over other.

Table no.1

After injecting yeast to induce pyrexia hourly temperature of all 24 rats was recorded.

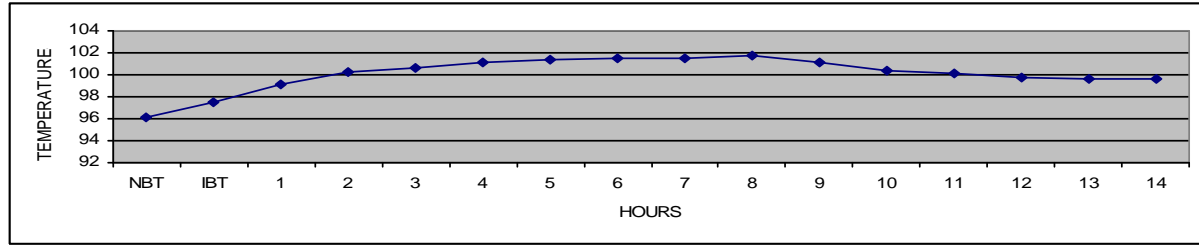
Initial Temperature Average initial temperature in the four groups is shown below:



Graph no.1

Initial temperatures (NBT) of all rats was recorded in the beginning of the experiment. This was found to be in the range of 95.05 F to 96.71 F.

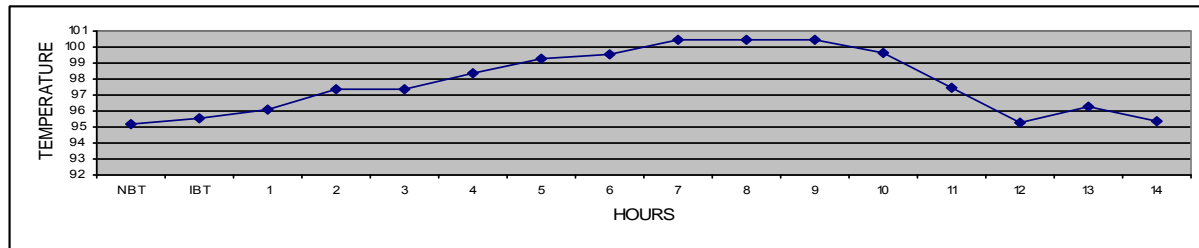
Average hourly temperature pattern in Control group



Graph no.2

In CG temperature suddenly increased in the first 2 hours. Further there was a gradual rise in temperature till 8th hour where it reached a maximum of 101.8 F. It then declined to 100.13 F by 11th hour. From there a slow dip in temperature took place to reach 99.60 F by 14th hour. The temperature never reached normal.

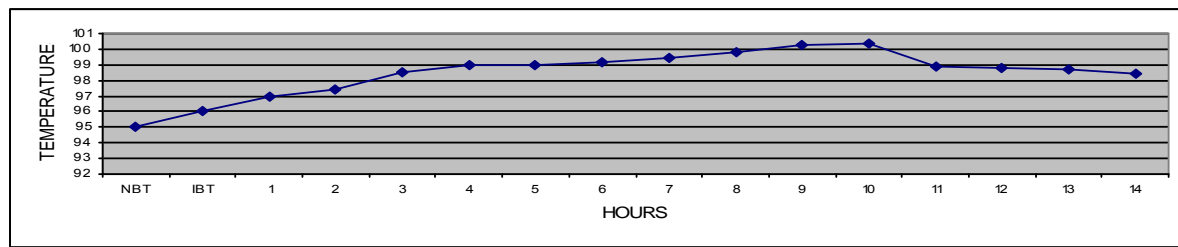
Average hourly temperature pattern in Standard group (paracetamol group)



Graph no.3

In standard group temperature suddenly increased in the first 2 hours. Further there was a gradual rise in temperature till 8th hour and reached a maximum of 100.48 F. It then started to decline from there uniformly and was observed to reach a temperature of 95.38 F in the 14th.hr

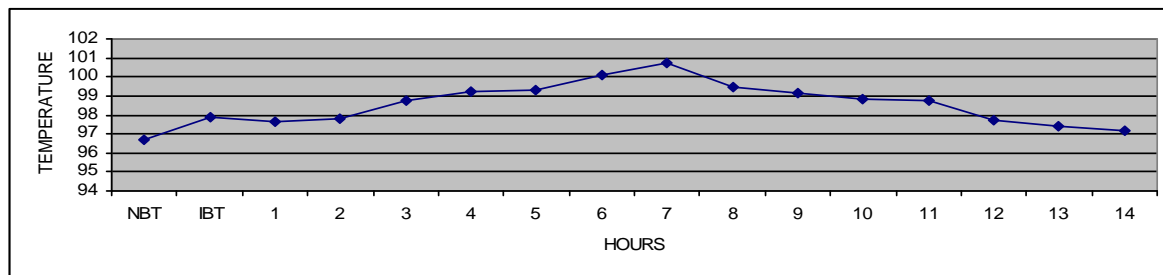
Average hourly temperature pattern in Trial group 1 (Kwatha of Oldenlandia corymbosa)



Graph no.4

In TG1 gradual rise in temperature was seen upto 10th hour which gradually reduced to 98.43 F

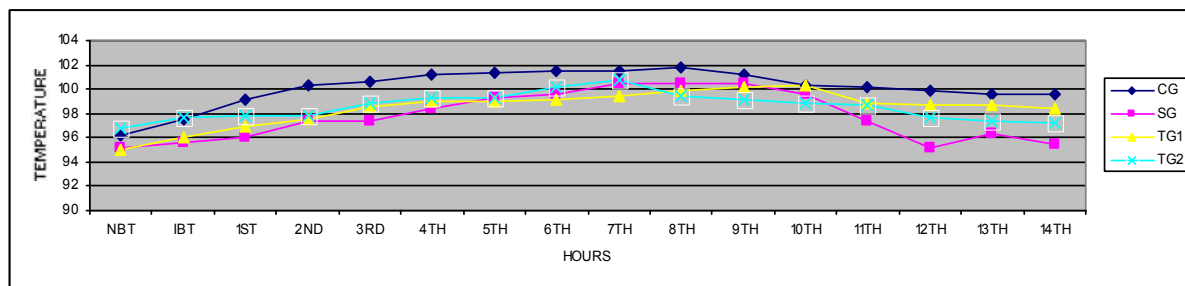
Average hourly temperature pattern in Trial group 2 (Kwatha of Fumaria indica)



Graph no.5

In TG2 a steep rise of temperature was observed in first four hours followed by gradual rise in temperature upto 7 th hour where it reached a maximum of 100.73 F. It then started to decline slowly and reached 97.16 F by 14th hour.

Hourly mean temperature of albino rats of control, standard and trial groups (Temperature in F)



Graph no.6

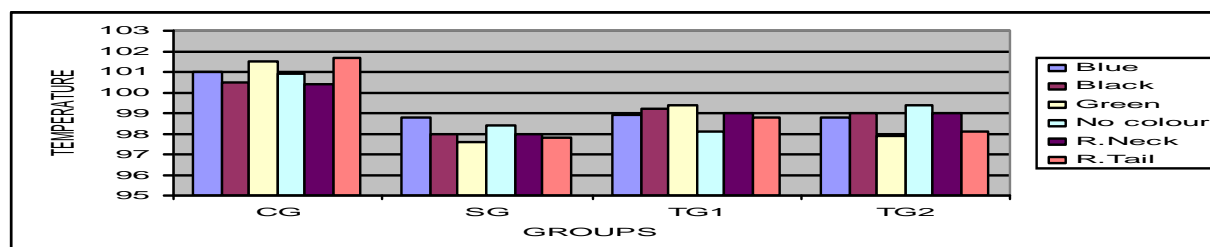
Mean hourly temperature in different groups is shown below

	NB T	IBT	1 st	4 th	5 th	8 th	9 th	10th	11 th	12 th	13th	14 th
SG	95.1 8	95.5 8	96.1 1	98.35	99.26	100.4 8	100.4 6	99.63	97.41	95.2 3	96.3 1	95.3 8
CG	96.1 3	97.4 8	99.1 3	101.1 6	101.3 3	101.8	101.1 8	100.3 6	100.1 3	99.8 1	99.6 5	99.6 0
TG	95.0 1	96.0 5	97 6	98.98	99	99.85	100.2 3	100.3 4	98.85	98.7 6	99.6 9	98.4 3
TG	96.7 2	97.6 1	97.8 8	99.23 3	99.28	99.48	99.11	98.8	98.73	97.7 0	97.4 3	97.1 6

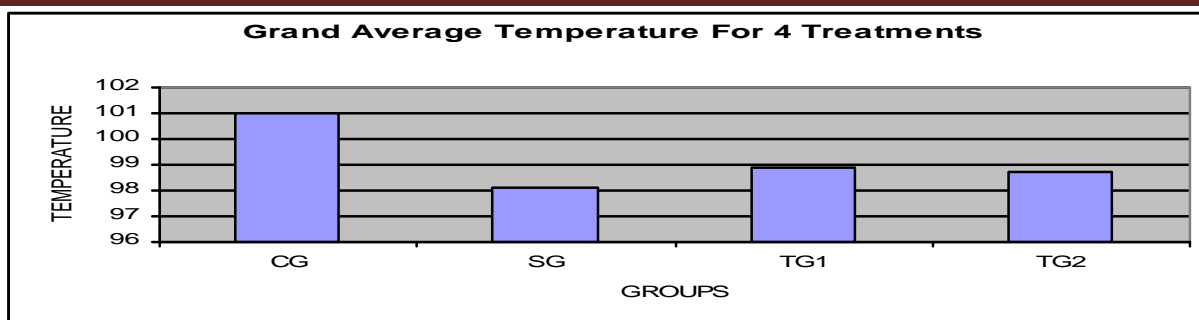
Table no.2

NBT - Normal body temperature, IBT - Initial body temperature, CG -Control Group (Distilled water), SG- Standard Group (Paracetamol suspension), TG1- Trial Group1 (*Kwatha* of *Oldenlandia corymbosa*), TG2-Trial Group2 (*Kwatha* of *Fumaria indica*)

Average Temperature in individual rats in different groups



Graph no.7 Grand Average of temperature in individual rats in different groups:



Graph no.8

The grand average of temperature in different groups indicates that the standard group has least grand average of 98.1 F and control group has highest of 101 F.

ANALYSIS Statistical Data of Experimental Groups:

GROUP	Grand Average Temperature	SD
Control	101	0.843
Standard	98.1	1.90
Trial group 1	98.9	0.931
Trial group 2	98.7	1.05

Table no.3

Statistical test carried out was ONE WAY ANOVA followed by Bonferroni POST HOC Test
Statistical analysis of obtained data

Comparison	Significant?	Corresponding “p” value	“t” value
SG VS CG	Yes	<0.01	4.007
SG VS TG1	No	>0.05	1.106
SG VS TG2	No	>0.05	0.829
TG1 VS CG	Yes	<0.05	2.902
TG2 VS CG	Yes	<0.05	3.178
TG1 VS TG2	No	>0.05	0.276

Table no.4 Mean square = 1.571, df = 52

DISCUSSION

Jwara (pyrexia) is a common condition¹¹ found in individuals. Parpataka is a commonly known anti-pyretic drug^{1,2,3,4,5,6,7,9,10}. The kwatha of its two varieties⁸ was thus administered in albino rats to evaluate their comparative efficacy in lowering down the elevated temperature found in jwara^{12,13,14}. When SG was compared with CG, the resultant “t” value was significant at p< 0.01. This shows that SG had moderately significant anti-pyretic property when compared to

control. When TG1 was compared with CG the resultant “t” value was significant at p<0.05. This shows that TG1 had significant anti-pyretic activity as compared to control. When TG 2 was compared with CG the resultant “t” value was found to be significant at p <0.05. This shows that TG2 had significant anti-pyretic activity as compared to CG. When TG1 was compared to SG the resultant “t” value was found to be insignificant at p >0.05 .This shows that TG1 had similar anti-pyretic activity as compared to SG.

When TG 2 was compared to SG the resultant “t” value was found to be insignificant at $p > 0.05$. This shows that TG 2 had similar anti-pyretic activity as compared to SG. When both the TG’s were compared to each other the resultant “t” value was found to be insignificant at $p > 0.05$. This suggests that anti-pyretic activity of both the TG’s were similar. However when the grand average temperature was taken into consideration it was found that the grand average temperature of SG was the lowest followed by TG2 and TG 1.

Considering this it may be concluded that anti-pyretic activity of TG2 was better than TG 1.

CONCLUSION:

Both trial groups are having significant anti-pyretic effect as compared to control. There is no difference in antipyretic effects produced by standard group and trial groups. However the grand average of temperature is lowest for the standard group followed by TG 2 and then by TG1. Hence the antipyretic effect of SG is better than both the trial groups. It can be concluded that antipyretic effect of TG 2 is better than TG1.

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Photographs of Trial drugs



Oldenlandia corymbosa (Dry Sample)



Fumaria indica (Dry Sample)



Kwatha of Trial Drug 1
(Oldenlandia corymbosa)



Kwatha of Trial Drug 2
(Fumaria indica)

Experimental study photographs



Preparation of Brewers yeast



Induction of pyrexia



Standard Drug (Calpol)



Administration of Standard Drug



Recording rectal temperature



Furs erected showing raise in temperature



Face bent down suggesting the fatigue due to rise in temperature.



Administration of trial drug