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AYURVEDA MEDICATED RECTAL SUPPOSITORY FOR PYREXIA: RESULTS OF ANIMAL STUDY

Ayurveda

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ABSTRACT

Antipyretic effect of 'Amruthotharam decoction'(AD),an Ayurvedic medicine, is well established. The bitter taste of the decoction makes it unacceptable to many especially in children .The present animal study is an attempt to overcome this. Suppositories containing AD were prepared for first time and were studied to find out the effect on pyrexia on 20 male New Zealand white rabbits and compared with that of paracetamol suppository. Result showed AD suppository when administered brought down pyrexia to normal temperature within 15 minutes. The study is thus concluded that AD with 1 gm suppository effectively reduced the peak rectal temperature shortly when compared to results with 1gm paracetamol suppository.

KEYWORDS

Rectal suppository; Pyrexia; 'Amruthotharam' decoction; Cocoa butter; Animal study; Rabbits

INTRODUCTION

Ayurveda prescribes different routes of drug administration for the effective application and absorption of it to achieve desired result. Among them 'guda varthi' or rectal suppository is simple but not explored yet. Ayurveda emphasize the validity, efficacy and the wide utility of "vasti"(medicated enema), in almost all diseases. In general, it is considered as half of the treatment. But there are times when the administration of 'vasti' may find difficult or contraindicated, especially in children.

Pyrexia, rise in body temperature, is the response of the immune system to fight against active infections. Pyrexia is one of the commonest ailment seen in our population, especially among children. Paracetamol is the most common antipyretic drug used for the management for pyrexia (Birmingham et al. 1997). Aim of the study is to find out, if a rectal suppository with an Ayurvedic medicine can give desired result like that of oral medicine in case of pyrexia. Considering this, pyrexia was preferred and the efficacy of the well-practiced medicine, 'Amruthotharam' decoction(AD) is being tried in the study as suppository.

MATERIALS AND METHODS

Animal Ethical Committee of the institution has granted permission to conduct this study.

Amruthotharam' decoction(AD) was preferred in this study. The formulation details of AD is shown in Table 1.

Table 1.Contents of Amruthotharam decoction (AD) and quantity

Sr.no	Name of drug	Amount
1	Zingiber officinale(Nagar)	20 gms
2.	Tinospora cordifolia (Guduci)	60 gms
3	Chebulic myrobalan (Hareethaki)	40 gms
Total		120gms

The above drugs were treated as per Ayurveda classic Sahasrayogam (Nishteshwar, Vidyanath 2008).

Modification of Amruthotharam decoction into dry powder was made by the following method. The decoction was made to 60 ml by boiling at 1000° C to get thick consistency paste form. Which was uniformly placed on a clean plastic sheet in a laboratory tray and allowed to dry into a thin film at 50 ° C in a laboratory drier for 12 hrs. The film was powdered and passed through a sieve (No.100 mesh size). This light brown colored powder being hygroscopic in nature was kept in air tight glass vessel till in use.

In this study, suppositories were prepared by fusion method. Cocoa butter was the base used. The calculation included determination of the amount of cocoa butter needed by using the displacement values as well as the amount of other ingredients.

One suppository of 1gm was of micronized trial drug powder (0.027 gm), cocoa butter (0.777gm), bees wax (0.196 gm). Suppositories of 0.5gm and 1gm were prepared. Suppositories were wrapped and kept in refrigerator till used.

In this experimental study, fourty male rabbits of New Zealand breed were chosen for the study. Their body weight ranged from 3 to 3.5 Kg. Animals were divided into four groups as shown below.

Groups	Animal number
Group A-Placebo	10
Group B-Standard drug-paracetamol*	10
Group C -Trial drug-1gm	10
Group D-Trial drug -0.5gm	10

Paracetamol suppository was purchased from market.

Before experimentation rectal temperature of rabbits were recorded by inserting a well lubricated bulb of a digital thermometer in the rectum. Care was taken to insert it to the same depth (about 6 cm) each time. All rabbits were on starvation for 24 hours prior to procedure except for water at libidum. Induction of fever was done by injecting 0.5ml boiled and cooled pure cow milk into subcutaneous air pouch of the animal. Mean rectal temperature after 2 hours of injection was measured. After attaining peak temperature suppositories were introduced in all four groups of animals and temperature was measured at 15 minutes interval up to 1 hour followed by hourly recording up to 4 hours.Paracetamol suppository is commonly available (Birmingham et al.1997;Vernon et al. 1979).

RESULTS

Average normal rectal temperature of animals was recorded as 101.6 oF, average peak temperature of all animals after inducing pyrexia was 103.33 oF. The results of the total study is given in Table 2 and Figure 1.

Table 2. Results of the total study

Temperature (0^{o}F) Before treatment -101.6		Temperature(0^{O} F) after treatment in minutes						
Group	After inducing pyrexia	15	30	45	60	120	180	240
A	103.33	103.48	103.36	103.06	102.88	102.22	101.80	101.62
B	103.33	102.84	102.5	102.34	102.2	101.96	101.68	101.62
C	103.33	101.95	101.85	101.77	101.62	101.62	101.62	101.62
D	103.33	102.22	102.16	102.10	102	101.8	101.62	101.62

Statistically significant results were noted(Table 3).In the study Group C and D, bowel movement was observed after 14 minutes of induction of pyrexia alongwith fall of temperature at 15 minutes(Table 2) . While in group A and B no bowel movement was seen.

Table 3 showing statistical significance difference seen in this study among groups of animals.

Minutes(after)	Statistical significance
15	C>D>B
30	C>D>B
45	C>D>B
60	C>D>B
Second hour onwards no difference in temperature was noted.	

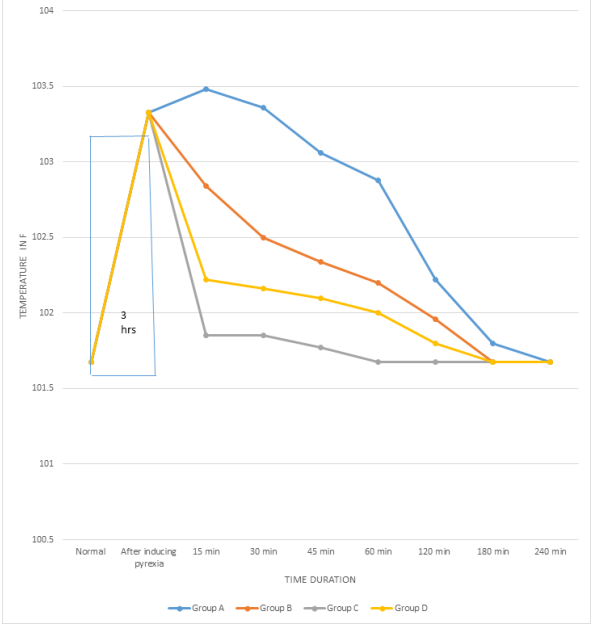

Figure 1.The results of the present study.

DISCUSSION

Pyrexia is one of the most common medical sign indicating body's immune response against various infections. Pyrexia caused by many conditions may threaten life if untreated. Many times recovery is possible without any attention. Commonly fever is managed with antipyretics which are used in the form of powder, tablets, syrup or injections.

Ayurveda literature gives detailed description of different types of fever,its causes, manifestation and also management through various ways. Ayurvedic management of fever include different combinations of herbs in various forms like powder,decoction,juice and external treatment at different stages of fever (Singhal 2007).

'Amrutottaram' decoction (AD) is one of the effective combination for the management of different types of fever complexes explained in Ayurvedic classic (Nishteshwar, Vidyanath 2008). However the administration is not easy especially among children or among adults, they remain reluctant due to its bitter taste . Ayurveda emphasize the validity, efficacy and the wide utility of medicated enema (vasti), in almost all diseases. The effectiveness of medicated enema (vasti) (Guduchi kashay siddha vasti) in fever is well established (Sharma 2006). But there are times when the administration of medicated enema (vasti) is either little difficult or contra- indicated, especially in children. Rectal suppository may be useful in such cases.AD is an effective drug for fever. Thus we selected it for suppository. Conversion of the combination of AD to rectal suppositories(Guda varti) may address this problem .

The present study is an attempt to standardize AD as rectal suppository and to assess the antipyretic action in comparison with paracetamol suppository.

During the procedure of preparation, in laboratory, the decoction was made into paste form at 500 C. This temperature was maintained for 12 hours. Permitting fine powder to fuse properly with the base excessive heat may result in charring and loss of active components.

We preferred cocoa butter as the base as it is natural, non- irritating, miscible with many ingredients and have the desired melting range. Bee wax was incorporated as a solidifying agent which was also to give softening effect of the drug. Final formula was derived after considering the physico chemical parameters of the ingredients .The suppositories weighing 1gm and 0.5gm were prepared so as to compare the efficacies.

Table 1and Figure 1 showed in Group C where suppository of 1 gm of AD was used, within 15 minutes maximum decrease in body temperature was observed. The temperature further reduced to the mean temperature on 60th minute on group C.

In the study Groups C and D, bowel movement was observed after 14 minutes and then the temperature reduced by 15 minute. While in Groups A and B bowel movement was seen very late and the fall in temperature too was very late. The present study showed that the commonly used AD made it into suppository form of 1 gm each was a good substitute for bringing down temperature quickly (Fig 1).The suppository shall be very useful for treating pediatric patients.

CONCLUSION

In conclusion, the experimental study proved AD suppository 1 gm is highly useful in case of pyrexia. The effectiveness appeared in 15 minutes time. Further analysis and pharmacological studies of the formulation may be done to find out the factor behind the anti-pyretic effect.

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