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Comparative Study of Effect of Crude Extract of Ficus Virens Aiten in Gut Motility of Erythromycin and Bethanechol Treated Albino Rats

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Abstract: ***Ficus virens aitens (phutkal) is used for diarrhea in Jharkhand, India. Since the concoction is usually taken empty stomach for its antidiarrhoeal effect. Ficus virens aiten, probably, acts by inhibition of gastrointestinal motility by Migrating Motor Complex, motilin and its receptors. This is an in-vivo comparative study of effect of Ficus virens aiten on transit time of erythromycin and bethanechol treated albino rats.***

Keywords: Migrating Motor Complex, motilin, transit time, erythromycin, bethanechol

1. Introduction

Phutkal (Ficus virens aiton) is used as house hold remedy for diarrhea in JHARKHAND. This is one of those around 150 wild herbs used for effect on diarrhoeal diseases in JHARKHAND[5].The concoction of leaf buds of Phutkal about 250ml is taken empty stomach for treatment of diarrhea. Although having medicinal value, Phutkal is very popular as a vegetable amongst tribal community of JHARKHAND.

Ficus viren aiton is of two types – (1) Red variety (2) White variety. Amongst these two, Red variety is mostly used as remedy for diarrhea and as vegetable while White variety used as vegetable. These leaf buds generally grows during Spring season, and are collected and processed by blanching and then get it sun dried. Then it is stored for further use. Traditionally this dried leaf buds are soaked in warm water.

Motilin mediated gut motility [1] –
Gastric motility in fasting state is called Migrating Motor Complex or (MMC).MMCs moves down the gastrointestinal tract at a regular rate during fasting, they are completely inhibited by a meal, and they resume 90 – 120 minutes after the meal. Endogenous Motilin, a poly peptide containing 22amino acid is major regulator of the migrating motor complexs. Motilin is secreted by enterochromaffin cells and Mo cells in the stomach, small intestine, and colon. It acts on G-protien – coupled receptors on enteric neurons in the duodenum and colon and on injection, produces contactions of smooth muscle in stomach and intestine. Its circulating level increases at intervals of approximately 100 min in interdigestive state. When meal is ingested, secretion of motilin is suppressed until digestion and absorption are complete[1]. The antibiotic erythromycin binds to motilin receptors[2, 4].

Migrating Motor Complex (MMC) consist of four distinct phases –
Phase 1- No spike potentials, no contractions
Phase 2- Irregular spike potentials and contractions
Phase 3- Regular spike potentials and contractions

Since for antidiarrheal effect, Ficus viren aiton is used in empty stomach, probably, Ficus viren aiton has an inhibitory effect on Migrating Motor Complex and hence motilin and its receptor.

Aims
This is a in-vivo comparative study of effect on gut motility by Ficus viren aiton on erythromycin treated and bethanecol treated Albino rats.

Objectives
1) To prepare an in vivo experimental design for study of effect of medicinal substances on gut motility.
2) To see gut motility modulation by Ficus viren aiton on erythromycin treated albino rats.
3) To see gut motility modulation by Ficus viren aiton on bethanechole treated albino rats.
4) To compare the effect of Ficus viren aiton on erythromycin and bethanechole treated albino rats.

2. Material and Method

Collection of plant material
Ficus viren aiton leaf bud will be collected from wild trees of nearby locations of RIMS, Ranchi and authenticated by Mrs Malti Kerketta, Associate Prof. Department of Botany, Ranchi College, Ranchi, Jharkhand.

Preparation of aqueous extract
About 250 grams of dried leaf buds of Ficus viren aiton collected from Ranchi JHARKHAND will be soaked in 250 ml of distilled water then blended in a blender for 10 minutes. The macerate will be filtered with muslin cloth to obtain an aquous solution will be centrifuged at 4000 rpm for 30 minutes. Then solution will be filtered with Whatman No. 1 filter paper and heat sterilized at 120 degree centigrade for 30 minutes. The solution is preserved aseptically in brown bottle at 4 degree centigrade for further use.

Standerd feeding method
Each feeding will consist of feeding of 6 glass beads of about 3 to 5 mm in size and fixed amount of about 25gm of rat food. Glass beads will be given through oral gavage, immediately followed by 25 gm of rat food given to eat orally. Water is given through feeding bottle ad lebium.

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In-vivo animal experiment

Total of 24 albino rats, will be divided in four groups (each group containing six Albino Rats between wt.150gm to 200gm approximately, 3 males and 3 females) of same age group kept in same cage conditions will be selected provisionally. All the rats will be fed by standard feeding method during experimentation. The standard Transit Time of all groups will be recorded before grouping them. The grouping criteria will be based on their transit time. The rats with similar transit time will be grouped into one group. There will be four groups of albino rats, Group A, B, C, D. Group A rats will be treated with high dose erythromycin 63 mg/kg body wt^3. Then 1 hour after, given food with standard feeding method. Time of feeding and Time of defecation will be recorded. Group B will be first treated with Ficus viren aiton 5ml/kg body wt. orally then 1hour after, treated with Erythromycin 63mg/kg body wt.. Then followed by standard feeding methods, after second 1 hour interval. Time of feeding and Time of defecation will be recorded. Group C will be treated with bethanechol 6.3mg /kg body wt. then followed by standard feeding methods. Time of feeding and Time of defecation will be recorded. Group D will be first treated with crude extract of Ficus viren aiton then 1 hour after treated with Bethanechol 6.3mg/kg body wt^3.Then 30 minutes after, followed by feeding by standard feeding method. Time of feeding and Time of defecation will be recorded.

There will be two control groups and two test groups. Group A will serve control group for group B. Group C will serve as control group for group D.

3. Recording of Transit Time

Transit Time is time between the time of feeding and time of defecation. After time period of six hours of feeding, the plain paper from under the iron wire cage changed every 5 minutes to 10 minutes with recording of time. Time after complete feeding of bead with 25 gm of rat food till the excretion of all six beads in feces will be taken into consideration. Every time of defecation, excreta will be checked for beads, till all the beads are collected. The mean of time of each episode of defecation will be calculated for time of defecation.

The Consort diagram will be explaining the division of albino rats into four groups and their criteria of grouping, the treatment received by each group and the outcome of the treatment received during experimentation. The observations and its outcome will be analyzed by ANOVA method. Observations will be statistically expressed by using Bar chart, column chart. Standard Deviation and Variance calculation and p-value will be mathematically calculated and demonstrated by column chart.

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