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Vaishnavi Wankhade
M.V.Sc. Student, Department of
Veterinary Clinical Medicine,
Ethics and Jurisprudence,
PGIVAS, Akola, Maharashtra,
India

SP Waghmare
Hospital Superintendent and
Head, Department of Veterinary
Clinical Medicine, Ethics and
Jurisprudence, PGIVAS, Akola,
Maharashtra, India

KS Pajai
Assistant Professor, Department
of Veterinary Clinical Medicine,
Ethics and Jurisprudence,
PGIVAS, Akola, Maharashtra,
India

MFMF Siddiqui
Hospital Registrar, Teaching
Veterinary Clinical Complex,
PGIVAS, Akola, Maharashtra,
India

SW Hajare
Assistant Professor, Department
of Pharmacology and
Toxicology, PGIVAS, Akola,
Maharashtra, India

S Sajid Ali
Assistant Professor, Department
of Animal Genetics and
Breeding, PGIVAS, Akola,
Maharashtra, India

GR Vaidya
Livestock Development Officer,
Department of Animal
Husbandry, Maharashtra, India

Correspondence

SP Waghmare
Hospital Superintendent and
Head, Department of Veterinary
Clinical Medicine, Ethics and
Jurisprudence, PGIVAS, Akola,
Maharashtra, India

Efficacy of polyherbal antidiarrhoeal formulation in diarrhoeic goats

Vaishnavi Wankhade, SP Waghmare, KS Pajai, MFMF Siddiqui, SW Hajare, S Sajid Ali and GR Vaidya

Abstract

Total 25 adult goats of either sex (2-5 years of age) suffering from diarrhoea were selected for study. All diarrhoeic Goats (T2) were treated with polyherbal antidiarrhoeal tablet (600 mg) containing extract of unripe fruit of *Aegle marmelos*, bark of *Dalbergia sissoo* and seeds of @ 1 tablet orally twice for 5 day along with fluid and supportive treatment depending on severity of case. One additional group (T1) of 10 normal healthy goats was kept as a normal control group. All the goats were subjected for clinical parameters before and after treatment. The statistical analysis revealed significant ($P < 0.01$) rise in temperature and heart rate in diarrhoeic goats as compare to normal control group (T₁) before treatment. The mean temperature and heart rate was significantly improved after treatment with Polyherbal antidiarrhoeal formulation in diarrhoeic goats. After treatment with polyherbal antidiarrhoeal, 6 (24%) goats recovered on 3rd day post treatment, 13 (52%) goats on 4th day post treatment and 6 (16%) goats recovered on 5th day after treatment on the basis of restoration of faecal consistency. These findings demonstrated that out of 25 diarrhoeic goats, 23 goats showed complete recovery on 5th day post treatment, indicated 92% recovery rate in diarrhoeic goats. Thus, the diarrhoeic goats treated with polyherbal antidiarrhoeal tablets containing *Aegle marmelos*, *Dalbergia sissoo* and *Holarrhena antidysenterica* showed complete recovery in diarrhoeic goats along with significant improvement in clinical parameters within 5th day post treatment.

Keywords: *Aegle marmelos*, *Dalbergia sissoo*, *Holarrhena antidysenterica*, diarrhoea, goats

Introduction

Diarrhoea is defined as an increase in the frequency, fluidity or volume of bowel movements and characterized by increased frequency of bowel sound, wet stools and abdominal pain. In clinical terms, it is used to describe increased liquidity of stools, usually associated with increased stool weight and frequency. Occurrence of diseases causes heavy economic losses in terms of livestock health and production. Advances in animal health are expected to play a major role in the progress of livestock industry. In order to increase production, health management practices are the major factors in determining the profitability and success of goat production. Goats suffer from many diseases, which result in mortality and morbidity losses resulting in low productivity of animals. Among the diseases affecting goats, gastrointestinal diseases such as enteritis is one of the most important and common health problem. The etiological agent causing diarrhoea in goats are bacterial, viral, protozoa, parasitic, nutritional, management and stress etc. It is one of most common clinical signs of GIT disease and involves both an increase in the motility of the gastrointestinal tract along with increased secretions and decrease in the absorption of fluid and thus, a loss of electrolytes and water results in severe dehydration and death.

There are many herbal plants such as *Aegle marmelos*, *Dalbergia sissoo*, *Holarrhena antidysenterica*, which possess antidiarrheal and antibacterial activity, which acts by reducing the gastrointestinal motility and gastric secretion and possess lesser side effects than the conventional drugs and thus are safer to use [7].

The present study was undertaken to evaluate the efficacy of polyherbal formulation in the form of tablet in diarrhoeic goats containing extracts of unripe fruit of *Aegle marmelos*, bark of *Dalbergia sissoo* and seeds of *Holarrhena antidysenterica* against diarrhoea.

Material and Method

The present study was carried out in the Department of Veterinary Clinical Medicine, Ethics and Jurisprudence and Teaching Veterinary Clinical Complex, Post Graduate Institute of Veterinary and Animal Sciences (PGIVAS), Akola (Maharashtra State). The unripe fruit of *Aegle marmelos*, bark of *Dalbergia sissoo* and seeds of *Holarrhena antidysenterica* were

collected and subjected for preparation of powder. The hydro-ethanolic extract (40% distilled water + 60% ethanol) of freshly prepared powder of unripe fruits of *Aegle marmelos*, bark of *Dalbergia sissoo*, seeds of *Holarrhena antidiysenterica* was prepared and per cent extractability was determined. The dose of polyherbal antidiarrhoeal formulation containing unripe fruit of *Aegle marmelos*, bark of *Dalbergia sissoo* and seeds of *Holarrhena antidiysenterica* was formulated as 28 mg/Kg body weight in goats based on Phytopharmacological study conducted by earlier research worker [5] as per the method of conversion of dose described by research worker. [6]. The polyherbal antidiarrhoeal tablets (600 mg) containing combination of unripe fruit of *Aegle marmelos*, bark of *Dalbergia sissoo* and seeds of *Holarrhena antidiysenterica* were prepared as per the standard defined steps. Total 25 adult goats of either sex (2-5 years of age) suffering from diarrhoea presented to Teaching Veterinary Clinical Complex, PGIVAS, Akola, District Veterinary Polyclinic, Akola and in and around Akola, Maharashtra, India were selected for the study. All the diarrhoeic goats were treated with polyherbal antidiarrhoeal (600 mg) tablets @ 1 tablet twice a day for 3-5 days along with fluid and supportive treatment (T₂). One additional group of 10 normal healthy goats was kept as a normal control group (T₁). The clinical parameters like rectal temperature (°F), heart rate (/min), respiration rate (/min) and faecal consistency score were recorded for all the diarrhoeic goats. The efficacy of polyherbal antidiarrhoeal tablet was judged on the basis of

restoration of clinical parameters to normal in diarrhoeic goats after treatment.

Result and discussion

In normal healthy goats (T₁), the faecal consistency was normal. The faecal consistency in all diarrhoeic goats was pasty to watery before initiation of treatment ('0' day). The per cent recovery in diarrhoeic goats on the basis of improvement in faecal consistency during post treatment days is presented in Table 1.

Table 1: Recovery per cent (%) in diarrhoeic goats during post treatment days

No of cases treated	No of cases recovered after treatment				
	1 st day	2 nd day	3 rd day	4 th day	5 th day
25	-	-	6	13	4
Per cent recovery	0%	0%	24%	52%	16%

Out of 25 animals treated, 6 animals showed normal faecal consistency on 3rd day post treatment, indicated 24% recovery rate. Faecal consistency was restored to normal in 13 animals on 4th day post treatment, indicated 52% recovery rate and 6 (16%) animals showed normal faecal consistency on 5th day after treatment. These results demonstrated progressive reduction in faecal consistency score in 23 diarrhoeic goats indicated 92% recovery rate on 5th day post treatment in diarrhoeic goats. Two diarrhoeic goats did not respond to treatment.

Table 2: The mean temperature (°F), heart rate (per min) and respiratory rate (per min) in T₁ and T₂ group at different intervals.

Parameter	Intervals						ANOVA	
	Before Treatment	After Treatment					F cal	P Value
	'0' day	1 st day	2 nd day	3 rd day	4 th day	5 th day		
Temperature (°F)								
Normal Control (T ₁)	102.02 ^c ± 0.08	101.86 ^b ± 0.18	101.88 ^{bc} ± 0.14	101.30 ^a ± 0.15	101.35 ^a ± 0.10	101.60 ^{ab} ± 0.11	5.268	0.001**
Treatment group (T ₂)	102.73 ^b ± 0.21	102.5 ^b ± 0.19	102.04 ^a ± 0.15	101.8 ^a ± 0.14	101.7 ^a ± 0.15	101.84 ^a ± 0.14	6.410	0.000**
Two Mean 'T' test	3.241**					1.312 ^{NS}		
Heart Rate (per min)								
Normal Control (T ₁)	61.20 ± 0.44	61.40 ± 0.42	61.70 ± 0.55	62.30 ± 0.55	61.50 ± 0.45	61.70 ± 0.47	0.598	0.701 ^{NS}
Treatment group (T ₂)	63.64 ^b ± 0.42	62.88 ^{ab} ± 0.41	62.96 ^{ab} ± 0.54	62.12 ^a ± 0.37	61.84 ^a ± 0.32	61.72 ^a ± 0.26	3.560	0.005**
Two Mean 'T' test	3.319**					0.039 ^{NS}		
Respiratory Rate (per min)								
Normal Control (T ₁)	25.90 ^c ± 0.90	23.90 ^b ± 0.64	23.10 ^b ± 0.60	22.90 ^b ± 0.31	20.90 ^a ± 0.37	22.50 ^{ab} ± 0.54	7.724	0.000**
Treatment group (T ₂)	24.20 ^d ± 0.54	23.44 ^{cd} ± 0.46	22.68 ^{bc} ± 0.33	22.32 ^{abc} ± 0.28	21.72 ^{ab} ± 0.32	21.36 ^a ± 0.28	7.662	0.000**
Two Mean 'T' test	1.648 ^{NS}					2.031*		

The mean body temperature (°F), heart rate and respiratory rate in normal control (T₁) and treatment group (T₂) before treatment ('0' day) and at different intervals post treatment are presented in Table 2. In healthy control group (T₁), mean rectal temperature (°F), heart rate (/min) and respiratory rate (/min) were within the normal range. The statistical analysis revealed significant (P < 0.01) rise in temperature and heart rate in group of diarrhoeic goats (T₂) as compare to normal control group (T₁) before treatment. These findings are in agreement with the earlier reports of increase in temperature and heart rate in diarrhoeic animals [4, 1, 2, 8, 10].

The mean respiratory rate did not differ significantly between group of diarrhoeic goats (T₂) and normal controls group (T₁) before treatment. In concurrence to this, earlier research worker [9] also reported non-significant changes in respiratory rate in diarrhoeic animals. The mean body temperature and heart rate was significantly improved after treatment with polyherbal antidiarrhoeal tablet in diarrhoeic goats.

In the present study, polyherbal antidiarrhoeal tablet showed remarkable improvement in faecal consistency along with clinical parameters on 5th day indicating recovery in diarrhoeic goats after treatment with polyherbal antidiarrhoeal. These result indicated that the polyherbal antidiarrhoeal preparation of extracts of unripe fruits of *Aegle marmelos*, bark of *D. sissoo* and seeds of *Holarrhena antidiysenterica* was found effective and proved a potent antidiarrhoeal in diarrhoeic goats. The finding of present study are in agreement with the findings of the research worker [4] who also reported potent antidiarrhoeal activity of polyherbal formulation containing extract of *Aegle marmelos*, *Dalbergia sissoo* and *Holarrhena antidiysenterica* in diarrhoeic goats. The antidiarrhoeal activity of this polyherbal formulation might be due to antidiarrhoeal, antibacterial, astringent and anti-inflammatory activities through the active principle such as tannins, flavonoids, alkaloids, saponins, steroid and terpenoids [3].

The study concluded that the polyherbal antidiarrhoeal tablet containing *Aegle marmelos*, *Dalbergia sissoo* and *Holarrhena antidysenterica* @ 1 tablet twice a day along with fluid and supportive therapy for five days found effective and safe remedy in inducing recovery in diarrhoeic goats with improvement in clinical parameters.

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