

Treatment of Clinical Cases of Bacterial Enteritis in Goat with New Polyherbal Antidiarrhoeal formulation

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Abstract

A study was conducted in fifty non-descript goats of 1-2 years of age, presented in Veterinary clinics of Shirval Veterinary College Maharashtra, India. Faecal and blood samples were collected from all the goats suffering from enteritis. Confirmative diagnosis of bacterial enteritis was done on the basis of bacteriological and haemato-biochemical tests. Animals were randomly divided into four (Group II to V) groups. Group I constituted of healthy animals (n= 10) (negative control), group II constituted diarrhoeic untreated animals (n=10) and Group III, IV and V (n=10) were the treatment groups. Group III animals were treated with polyherbal antidiarrhoeal formulation AV/ADC/16 @10gm BID for 4 days (coded formulation supplied by *Ayurved Ltd. Baddi India*), group IV treated with AV/ADC/16@15gms BID for 4 days and group V was treated with combination of AV/ADC/16 @ 10 gm and Ofloxacin @100mg BID for 4 days. In addition to clinical observations, haemato-biochemical parameters were recorded before and after treatment. The polyherbal antidiarrhoeal formulation AV/ADC/16 alone and in combination with antibiotics was found to be effective to treat diarrhoea, regain appetite and improved overall general body condition.

Keywords: Goat, Enteritis, Bacteriological, Polyherbal, Antidiarrhoeal.

Introduction

Goat is called as poor man's cow and is the second most important livestock in India, which plays important role in rural economy. *Escherichia coli* scour is an opportunistic disease associated with sloppy environmental conditions, poor sanitation and managerial practices. It is also called "watery mouth," because affected lambs salivate and have a cold mouth. (Scott and Gessert, 1996). Bacterial enteritis is the most important cause of diarrhoea in lambs and goat kids. *Enterotoxigenic Escherichia coli* (ETEC) and *Cryptosporidium parvum* are considered among the most prevalent causative agent of enteritis in goats (Gerald et al. 1992). Causative agent *E.coli* has two different virulent strains, one type is associated with enterotoxigenic *E.coli*, which has two virulence factors responsible for diarrhoea. *E.coli* is causative agent of white scour in goat (*Bhat et al., 2008*). Animals suffering from white scour have severe colitis characterized by abdominal pain, pasty faeces, severe enteritis may culminate into death due to severe dehydration. (*Radostis et al., 1995*) *Salmonella enteritidis* produces enterotoxins which are invasive to cause inflammatory change within the intestine leading to diarrhoea Bacterial enteritis remains the most common clinical problem in the Goats. Despite

improvement in managerial practices and prevention and treatment strategies, enteritis is still the most common and costly disease affecting small ruminants. Indiscriminate usage of antibiotics in animals for the treatment of various bacterial infections has led to emergence of resistant strains. Current study was designed to evaluate the efficacy of polyherbal antidiarrhoeal formulation in treatment of bacterial enteritis. This study may also be helpful in enhancing the dynamism of goat farming which not only alleviates the problem of enteritis in goat but also improves general body health condition.

Materials and methods

This study was conducted at Veterinary Clinics, College Veterinary and Animal Husbandry, Shirval, Maharashtra, India. Forty male and female non-descript goats of 1-2 years of age presented in the clinics with history of diarrhoea, anorexia and pasty faeces were selected for current study and were divided into four groups, positive control (diarrhoeic untreated), III, IV & V were the treatment groups. Group III animals were administered with polyherbal antidiarrhoeal formulation AV/ADC/16 @10gm BID for 4 days (coded formulation supplied by *Ayurved Ltd. Baddi India*), group IV treated with AV/ADC/16@15gms BID for 4 days and group V was treated with

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combination of AV/ADC/16@10 gm and Ofloxacin@ 100mg BID for 4 days. AV/ ADC/16 is the combination of herbs viz. *Holarrhena antidysenterica*, *Aegle marmelos*, *Punica granatum*, *Berberis aristata* and many more which were scientifically well studied for their antidiarrhoeal, antibacterial, stomachic, antifungal and anti-inflammatory properties (Mazumder et al., 2006 ; Rani and Khullar, 2004; Sack and Froehlich, 1982). Sterile cotton swabs were used for faecal sample collection in screw capped polypropylene tubes. Among haemato-biochemical parameters, total erythrocyte count (TEC), haemo-globin (Hb) and packed cell volume (PCV), serum glucose and serum proteins were evaluated and for that blood samples (2-3 ml/animal) were collected. Haematology was performed as per the method described by (Schalm et. al., 1975) and biochemical estimation of serum glucose and protein done by the method described by Annino (1976).

Results and Discussion

Faecal samples collected from the diarrhoeic goats (Group II to V) for bacteriological examination were found to be positive for either *Salmonella enteritidis* and *Escherichia coli* (*E.coli*). All the animals exhibited clinical signs of enteritis viz. diarrhoea with mucous and blood, pasty or loose faeces, anorexia, emaciation, rough body coat, poor body weight gain and reduced elasticity of skin indicating dehydration. Group II untreated diarrhoeic animals showed symptoms of severe dehydration, tachycardia, anorexia, reluctance movement and dyspnoea, as observed throughout experimental period. Mortality in the untreated control group II was found to be 10%. The animals of Group III receiving polyherbal antidiarrhoeal formulation AV/ADC/16@10gms BID for 4 days did not show complete recovery at the end of 4 days treatment and clinical signs were relatively mild. Group IV animals treated with AV/ADC/16@15gms BID for 4 days exhibited faster recovery from day 2nd of treatment while complete recovery was attained on day 4th. Group V given combination of AV/ADC/16@10gms BID & Ofloxacin @ 100gms BID for 4 days showed recovery 2nd day onward. Ofloxacin is recommended antibiotic therapy in bacterial enteritis (Lang et al., 1990). The efficacy of combined treatment (group V) was non-significantly different from group IV. Haematological parameters (TEC, Hb & PCV) in group II to V evaluated before initiation of treatment were found to be significantly lower than the respective normal values of healthy control group. TEC values of treated group III, IV and V after 4th days were 10.65 ± 1.05 , 11.39 ± 1.5 and 14.87 ± 1.42 ($\times 10^6/\mu\text{L}$) respectively, significantly ($P < 0.05$) higher than the untreated control group II (9.27 ± 1.42). PCV values of treated group III, IV and V after 4th days were

27.30 ± 1.49 , 30.06 ± 4.48 and 33.40 ± 3.2 (%) respectively, significantly ($P < 0.05$) higher than the untreated control group II (23.83 ± 3.19). Hb values of treated group III, IV and V after 4th days were 7.78 ± 0.81 , 7.95 ± 1.0 and 9.62 ± 0.5 g/dl respectively, significantly ($P < 0.05$) higher than the untreated control group II (6.73 ± 1.18). Phad, (2005) recorded the reduction in haematocrit values in chicks orally infected with *E.coli*. Similar results have been seen in present study in the untreated positive control group, however, administration of AV/ADC/16 has normalized the overall blood picture. Biochemical findings of serum protein values in group III, IV and V after treatment of AV/ADC/16 after 4th day is 6.15, 6.37 and 6.36 g/dl respectively, significantly ($P < 0.05$) higher than the untreated control group II (6.17 g/dl). In serum glucose values were 62.25, 64.19 and 62.99 mg/dl respectively, significantly ($P < 0.05$) higher than the untreated control group II (60.98 mg/dl). Phad (2005) and Deshmukh (2006) observed reduction in total serum protein and glucose levels in *E.coli* infected birds. The Polyherbal antidiarrhoeal formulation AV/ADC/16 contains *Holarrhena antidysenterica*, *Aegle marmelos*, *Punica granatum*, *Berberis aristata* herbs and many more. *Holarrhena antidysenterica* and *Punica granatum* has antibacterial and antidiarrhoeal property (Aqil and Ahmad, 2007 and Voravuthikunchai et al., 2004). Rani and Khullar, (2004) also reported antibacterial activity of plant extracts of *Aegle marmelos*. Mazumder et al., (2006) reported efficacy of *Aegle marmelos* in treatment of bacterial enteritis. *Punica granatum* has antidiarrhoeal, antimicrobial and stomachic property (Qnais et al., 2007). Singh (2007) studied in vitro and in vivo antimicrobial activity of *Berberis aristata* against *E.coli*. Sack and Froehlich, (1982) also reported similar findings. Upon bacteriological culture examination of faecal samples collected from affected and treated animals (group III-V), all the samples were found negative of *E.coli* after treatment with herbal formulation. Similar findings of efficacy of herbal preparation AV/ADC/16@2 kg/tonne of feed, in completely treating induced bacterial enteritis (*E.coli*) in broiler was reported by (Mahajan, V, 2008). Koundayana, B. (2008) also reported similar findings in *Salmonella enteritidis* induced enteritis in poultry. On the basis of haemato-biochemical, bacteriological and clinical findings, it is concluded that polyherbal formulation AV/ADC/16 is efficacious in treatment of bacterial enteritis in goat with normalization of appetite & general body condition.

Conclusion

Therefore, it is concluded that the administration of polyherbal antidiarrhoeal formulation AV/ADC/16 @ 15 gm per animal bid orally to Group III to V showed

Table-1. Mean Haematological values (TEC, Hb & PCV) of group I to V on day 0 and day 4th

Groups	RBC (X 10 ⁶ /μL)		Hb (g/dl)		PCV (%)	
	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment
I	10.63 ± 0.83	11.45 ± 1.2	7.36 ± 0.51	8.10 ± 0.6	27.7 ± 0.7	27.40 ± 6.1
II	8.74 ± 1.3	9.27 ± 1.42	6.1 ± 1.26	6.73 ± 1.18	29 ± 0.8	23.83 ± 1.19
III	9.12 ± 1.07	10.65 ± 1.05	7.17 ± 0.8	7.78 ± 0.81	26.6 ± 1.6	27.30 ± 1.49
IV	8.88 ± 1.5	11.39 ± 1.5	7.39 ± 0.87	7.95 ± 1.0	28.9 ± 41.4	30.06 ± 1.4
V	9.4 ± 1.4	14.87 ± 1.42	8.06 ± 0.5	9.62 ± 0.5	32.2 ± 1.2	33.40 ± 1.2

Table-2. Mean Biochemical values of group I to V on day 0 and day 4th

Groups	Serum Glucose (mg/dl)		Serum Protein (g/dl)	
	Before Treatment	After Treatment	Before Treatment	After Treatment
I	63.93± 0.13 ^a	62.24± 0.83	6.02± 1.4	6.16± 0.4 ^a
II	63.83± 0.87 ^a	60.98± 0.5 ^a	5.83± 1.03 ^a	6.17± 1.7 ^a
III	60.25± 0.21	62.25± 1.2	5.± 1.01	6.1± 0.9 ^a
IV	58.97± 0.97	64.19± 1.4	6.07± 0.4	6.37± 0.64
V	58.66± 1.25	62.99± 0.9	6.02± 0.7	6.36± 1.24

Values bearing superscript differs significantly at 5% level of significance

higher efficacy to check the diarrhoea with regain appetite & overall improvement in the general body condition, hence recommended for the field use either alone in moderate cases & as a co-therapy in severe cases of bacterial enteritis. It is also inferred that in extreme cases combination with Ofloxacin showed immediate recovery from the diarrhoea.

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