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RESEARCH ARTICLE

POST VACCINATION IMMUNE RESPONSE POTENTIATION WITH RESTOBAL IN LAMBS AND SHEEP

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ABSTRACT

Antibody titre is an indicator of immune response of animal against vaccination. An experimental trial was conducted to evaluate the efficacy of a polyherbal immunomodulatory, antistressor, adaptogenic and rejuvenator product Restobal (*supplied by M/S Ayurvet Ltd. Baddi, HP, India*) in potentiating post vaccinal immune response against Blue tongue vaccination in Deccani lambs and sheeps. In the experiment twelve (142 days old) lambs were divided into two groups. Group C1: untreated control and group T1: treated with Restobal @ 10ml BID for 5 days pre and 5 days post vaccination and twelve (408 days old) adult sheeps were divided into two groups. Group C2: untreated control and group T2: Restobal @ 20ml BID for 5 days pre and 5 days post vaccination. The immune response potentiating efficacy of the product was assessed in terms of serum antibody titre against blue tongue virus. In addition the serum biochemical profile was also done. At the end of 28 days post vaccination, significantly high antibody titre was observed in treated groups as compared to control groups in both the trials. The results of the present experiment indicate the immune response potentiating effects of the Restobal in lambs and adult sheeps.

INTRODUCTION

Small ruminants are very important resources throughout the world and contribute meat, milk, and fiber that are significant to the productivity, stability and sustenance of many farming systems more so on dry lands (Devendra, 1989). There are various diseases associated with small ruminants. Bluetongue disease is a non-contagious, insect-borne, viral disease of ruminants especially sheep (Jensen *et al*., 1982). Prevention is done by vaccination with live modified virus vaccine. The response to vaccination may be affected by various factors like variation in feed intake, protein deficiency, starvation, shortage of feeding space, vaccination and various other managemental operations which ultimately cause decreased immune response against vaccination (Glick *et al.,* 1981). Therefore, it is essential to enhance the immune response against vaccination by supplementation of immune potentiating agents to prevent the vaccination failure. Immunomodulatory agents of plant and animal origin enhance the immune responsiveness of an organism against a pathogen by activating the immune system (Gupta *et al*., 2006). There are several herbs used in the indigenous systems of medicine that may enhance the body's immune system. A variety of plant derived materials such as polysaccharides, tannins, flavonoids, peptides and lectins have been reported to potentiate the immune system (Ielpo *et al*., 2000; Kuttan, 2000). Indian medicinal plants are a rich source of substances which are claimed to induce paraimmunity, the non-specific immunomodulation of essentially granulocytes, macrophages, natural killer cells and complement functions (Sainis *et al*., 1997). Potentiating the immune response using medicinal plants can provide an alternative to conventional chemotherapy for a variety of diseases. Hence, the present experiment was conducted to study the efficacy of polyherbal product Restobal in potentiating immune response in Deccani lambs and sheep vaccinated with inactivated multivalent Blue Tongue.

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MATERIALS AND METHODS

The experiment was conducted in Central Research Institute for Dry Land Agriculture, Santoshnagar, Hyderbad, India in Deccani breed of sheeps. A total of 12 lambs (142 ±8.1 days old with mean body weight of 14.8 ± 0.23 kg) and 12 adult sheeps (408 ± 13.7 days old with mean body weight of 28.3 ± 0.41 kg) of were selected for the experiments. The animals were dewormed against internal parasites and after thorough examination for good health allowed to acclimatize to the conditions for a period of 7 days prior to commencement of experimentation. The animals were randomly divided into two groups comprising 6 animals each considering age, body weight, as uniform as possible & fed with same diet throughout the experiment. Animals were supplemented with 150 and 250g of concentrate mixture (CP: 18 and 4 TDN:70%) per day per animal, respectively. In addition mineral bricks were provided in the pens.

Lambs were divided into group C1: control group without any treatment and group T1: Restobal @10ml BID for 5 days pre and 5 days post vaccination to lambs. Similarly the adult sheeps were divided into two groups group C2: control group without any treatment and group T2: Restobal @ 20ml BID for 5 days pre and 5 days post vaccination. The product comprises of herbs namely *Ocimum sanctum, Withania somnifera, Phyllanthus emblica* and many more in fixed concentration.

Vaccination was done with inactivated pentavalent Blue tongue vaccine @1ml per animal subcutaneously. At day 28 post vaccination serum samples were collected from individual animals and Antibody tires in serum samples were assessed with competitive enzyme linked immuno sorbent assay according to Jochim protocol (Jochim 1976). The antibody titres in serum samples less than 50 are considered as seronegative and more than 50 as seropositive. Serum samples were further analyzed for metabolites like Albumin, Urea (BUN) and Creatinine and also Transaminase (SGOT and SGPT) using Qualigens Diagnostic kits.

Fig. Serum sample for antibody titre

Table 1. Antibody titre for blue tongue virus in lambs

	Control (C1)							Treatment (T1)						
Animal No.	1	2	3	4	5	6	Avg.	7	8	9	10	11	12	Avg
Day 0	3.2	2.8	3.1	2.8	3.6	2.9	3.07	2.8	3.6	3.2	2.5	2.9	3.1	3.02
Day 28	69.1	69.4	71.2	70.6	68.2	70.8	69.88[a]	98.6	99.7	99.3	99.1	98.9	99.4	99.17[b]

a, b: Means with different superscripts differ significantly at P<0.01

Table 2. Antibody titre for blue tongue virus in adult sheeps

	Control (C2)							Treatment (T2)						
Animal No.	1	2	3	4	5	6	Avg	7	8	9	10	11	12	Avg
Day 0	22.8	13.6	16.8	17.2	9.6	11.2	15.20	20.7	15.5	4.59	4.08	18.7	13.1	12.78
Day 28	58.1	52.1	65.4	58.2	55.3	58.2	57.88[a]	99.7	92.8	75.0	98.4	92.0	94.7	92.10[b]

a, b: Means with different superscripts differ significantly at P<0.01

Recording of Data

All the results were analyzed statistically by using student's `t' test as per Snedecor and Cochran (1994).

RESULTS

There was no significant difference in the antibody titre of the animals in both the treated and untreated groups at day 0. Significant increase in the antibody titre was observed at day 28 post vaccination in both the groups, but the antibody titre against blue tongue (BT) of Restobal treated group T1 (99.17) was significantly (P< 0.01) higher as compared to lambs in untreated group C1 (69.88) (Table 1). Similar results were obtained in case of adult sheeps (92.10 in Restobal treated group T2 and 57.88 in untreated control group C2) (Table 2). This could be due to stimulation of immunity in lambs and sheep by the administered herbal immunomodulator Restobal. Further, blood biochemical and liver function profiles were comparable among the treatment groups and there was no significant difference (P>0.05) in the values of serum albumin, blood urea nitrogen, creatinine and SGOT and SGPT in Deccani sheep fed with Restobal product as compared to untreated control indicating no harmful adverse effect of the product on vital organs of the animals.

DISCUSSION

The findings of the present study are in collaboration with the findings of Ather, 1998; Mohammed Younus, 1996 and Bora *et al*. 1998, who observed similar immunopotentiating results of a polyherbal formulation containing *Ocimum sanctum, Withania somnifera* and *Phyllanthus emblica* against Newcastle disease, IBD and Pigeon pox virus respectively in broiler birds. These results can be attributed to the individual constituent herbs of Restobal. The studies have demonstrated that Ocimum sanctum has potential to modulate both humoral and cell-mediated immune responsiveness and these immunomodulatory effects may be mediated by GABAnergic pathway by acting at various levels in the immune mechanisms such as antibody production, release of mediators of hypersensitivity reactions and tissue responses to these mediators on the target organs (Mediratta *et al*., 1988 and Satyavanti *et al*., 1976). Similarly Gupta *et al*. 2006 explored the efficacy of Withania somnifera as immune response potentiating agent. The improvement in immune response with Phyllanthus emblica has been revealed by the findings of Sai Ram *et al*., 2002.

Conclusion

From the results of the present study it can be concluded that the polyherbal product Restobal is a potent immune enhancing agent which improved the antibody titre against Blue tongue virus vaccine and thus potentiate the immune response of the animal which may be attributed to the immunomodulatory, antistressor and adaptogenic properties of the constituent herbs of Restobal.

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