IMMUNOMODULATION WITH KAMDHENU ARK IN MICE

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ABSTRACT


The immunomodulatory effect of Kamdhenu ark was studied on 20 mice divided into 2 groups. Groups I was kept as control while group II mice were given 1 ml Kamdhenu ark in water for a period of 90 days. Results indicated that there was increased B- and T- lymphocyte blastogenesis, increased IgG, IgA antibody titres in mice treated with Kamdhenu ark in comparison to controls.

Key words: Cow therapy, Kamdhenu ark, mice, immunomodulation.

INTRODUCTION

The immune system of an individual is highly susceptible to a number of clinical conditions such as infection, cancer, surgery or to the administration of chemical drugs and pollutants in feed. Stress either physical or psychological also causes immune dysfunction. The environmental pollutants such as pesticides, heavy metals, mycotoxins etc. present in various food may alter immunity and suppression of immune system allows opportunistic pathogens to overwhelm and cause mortality (Koller, 1979, Chauhan et al., 1997). It has been observed during last few years that desired protection is not achieved against diseases for which animals are vaccinated (Chauhan and Mahipal, 1994) . To enhance the immunocompetence of animals, various chemical drugs such as aluminium compounds, dextran sulphate and levamisole etc. are used (Quinn, 1990). In Indian ancient literature several herbal preparations have been described, which can be given to animals in order to augment the immune response (Bhargava and Singh, 1981). In this direction earlier some herbal preparations have been studied for their immunomodulatory properties (Chauhan, 1999; Chatterjee, 1994). Panchgavya therapy plays an important role in ayurvedic system of medicine. Panchgavya means the mixture of natural products of cow like milk, curd, ghee, urine and dung. In the ancient literature, it is mentioned that it may increase the resistance of the body. But there seems to be no authentic scientific report about the efficacy of panchgavya components. Present study was carried out to investigate the immunomodulatory properties of “Kamdhenu ark”, a preparation having zebu cattle urine, in mice.

MATERIALS AND METHODS

Twenty young growing mice were housed in standard cages and acclimatized to laboratory conditions for seven days. The animals were maintained on pellet diet and water ad libitum. The mice were divided into two groups of ten each. The mice of group I served as control
while group II mice were given Kamdhenu ark (Go Vigyan Anusandhan Kendra, Nagpur) @ 1 ml per ten mice daily with water.

Blood was collected directly from heart in mice at monthly intervals and serum was separated. Serum IgG, IgM and IgA levels were estimated using enzyme linked immunosorbent assay (Chauhan, 1995). Lymphoid cells were collected from spleen of mice and lymphocyte stimulation test was performed using mitogens Con-A for T-lymphocytes and lipopolysaccharide for B-lymphocytes (Chauhan, 1998). MTT dye was used as indicator system. Mean delta O.D. was calculated for T- and B-lymphocytes and results were compared for significance using 't' test.

RESULTS AND DISCUSSION

Mean delta OD for T- and B-lymphocyte of both groups are presented in Table 1. Comparison of both groups revealed the mean delta OD of Con-A and LPS stimulated cultures of lymphocytes from Kamdhenu ark treated mice were significantly higher than delta OD of the corresponding control group. The mean delta OD for T-lymphocyte was 0.089±0.006 in control mice on 90th day while it was 0.146±0.011 in treated mice. Mean delta OD for B-lymphocytes was 0.142±0.021 in treated mice at the end of experiment. The significant increase in Con-A stimulated culture of lymphocytes is indicative of enhanced cell mediated immunity as it measures the blastogenic capacity of T-lymphocytes. Similarly, augmentation in blastogenic capacity of B-lymphocytes is indicative of enhanced humoral immune response responsible for antibody production.

Table 1. Effect of Kamdhenu ark on blastogenesis of T- and B-lymphocytes

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Days</th>
<th>Mean Δ O.D. (Control)</th>
<th>Mean Δ O.D. (T-cells)</th>
<th>Mean Δ O.D. (B-cells)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>30</td>
<td>0.058±0.003</td>
<td>0.078±0.012</td>
<td>0.078±0.004</td>
</tr>
<tr>
<td>2.</td>
<td>60</td>
<td>0.088±0.010</td>
<td>0.118±0.007</td>
<td>0.123±0.005</td>
</tr>
<tr>
<td>3.</td>
<td>90</td>
<td>0.089±0.006</td>
<td>0.146±0.011</td>
<td>0.142±0.021</td>
</tr>
</tbody>
</table>

The mean ELISA values reflecting the effect of Kamdhenu ark on serum IgG, IgM and IgA in mice are presented in Table 2. There was significant increase in IgG and IgM levels of mice after three months of treatment. ELISA values for IgG and IgM were 2.149±0.005 and 2.031±0.001 in control while these were 2.576±0.002 and 2.418±0.008 in treated mice at the end of experiment. There was not significant difference in IgA levels in both groups.

Table: 2. Effect of Kamdhenu ark on mean ELISA values for IgG, IgM and IgA

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Days</th>
<th>IgG</th>
<th>IgG</th>
<th>IgG</th>
<th>IgM</th>
<th>IgM</th>
<th>IgM</th>
<th>IgM</th>
<th>IgA</th>
<th>IgA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>30</td>
<td>2.148±0.002</td>
<td>2.141±0.008</td>
<td>2.014±0.006</td>
<td>2.012±0.003</td>
<td>1.402±0.018</td>
<td>1.412±0.003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>60</td>
<td>2.165±0.012</td>
<td>2.435±0.001</td>
<td>2.000±0.021</td>
<td>2.336±0.014</td>
<td>1.578±0.004</td>
<td>1.650±0.018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>90</td>
<td>2.149±0.005</td>
<td>2.576±0.002</td>
<td>2.031±0.001</td>
<td>2.418±0.008</td>
<td>1.880±0.006</td>
<td>1.870±0.015</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Immunomodulation is one of the most important alternatives in order to control the diseases with additional advantages of amplifying the specific responses to vaccines. Immunomodulatory compounds offer the prospect of reversing immunosuppression caused by stress, infection, surgery or environmental pollution (Chauhan, 1998). The impact of
chemotherapy and vaccination on many complex diseases of animals has reached a plateau and if further progress is to be made different strategies have to be developed. There are many herbs, which are known to exert their immunomodulatory properties of which some of them are studied scientifically but most of them are yet to be scientifically validated. Immuplus a polyherbal formulation was prepared from the extracts of Giloy (Tinospora cordifolia), Ashwagandha (Withania somnifera), Aonla (Emblica officinalis) and Tulsi (Ocimum sanctum) and studied for their immunomodulatory properties in dogs (Chauhan, 1991) and chickens (Singh and Chauhan, 2000). The immunomodulatory effect of Immu-21, an ayurvedic formulation was also studied in different laboratory animals and it was found that Immu-21 increased the microbiocidal activity of neutrophils (Chatterjee, 1994). Another preparation “Immuraksha” was also prepared and its immunomodulatory properties were studied in chickens (Chauhan et al., 2000). Quinn (1990) has established certain criteria for an ideal immunomodulatory drug that it should not have toxic, teratogenic, carcinogenic, residual or any other side effects. A good immunomodulatory preparation should enhance both specific and paraspecific immunity of body. Also, it should be stable and compatible with other drugs and vaccines. During the present investigation no toxic or pathologic abnormality was detected in treated mice. Rather, these mice were having increased weight and increased reproduction as these mice become 34 form ten during the course of experiment while the control were grown to 23 only.

It can be concluded from the present investigation that the ‘Kamdhenu ark’ therapy exerts its immunomodulatory effects in mice and can be used to augment the immunity. However, it needs further detailed research regarding its proper dosage, duration of treatment and side effects, it any.

ACKNOWLEDGEMENT

Authors are thankful to Shri Suneel Mansinghka, Officer Incharge, Govigyan Anusandhan Kendra, Nagpur for Providing Kamdhenu ark. Thanks are also due to Director, Exp. Station and Dean, Veterinary Sciences for facilities.

REFERENCES


EDITORIAL

Rapid advancement in human civilization has inadvertently brought a larger number of synthetic chemicals in our environment which are posing serious concern to health of man and animals. Scientific studies have revealed that most of the pollutants including pesticides and heavy metals are immunotoxic and thus leading to immunosuppression rendering the host more susceptible to infectious diseases. Further, there have been increasing incidences of resistance development in bacteria against various antibiotics and the situation has reached when most of the bacteria are exhibiting resistance to one or other kind of antibacterial preparation. All antibacterial drugs can be conveniently divided into the bacteriostatics and the bactericidals; most of the antibiotic fall under the bacteriostatic group which only checks the growth of bacteria and does not kill them. However, these bacteria are phagocytosed and destroyed by the macrophages of the host. The decreased activity of macrophages under the influence of immunosuppression caused by environmental pollution leads to recurrent infections. WHO also reported that most of the antibiotics will lose their antibacterial action by the year 2020. In such situation, the only alternative is immunomodulation. Keeping this scenario in mind, the SIIP has planned to hold a two days National Symposium on “Immunomodulation in Health & Disease” on December 14-15-2001 at Pantnagar under the patronage of Dr. C.M. Singh President VCI and Dr. N.K. Ganguly, D.G. ICMR. The symposium will focus on issues related to immunosuppression, immunopotentiation, hypersensitive and autoimmune reactions, herbal immunomodulation and immunity to mycobacterial infections.

More emphasis will be laid on immunopotentiating agents of herbal origin under our Indian system of medicine (Ayurved). Simultaneously, there will be discussion on cow therapy including the Panchgavya principle of disease cure described in Ayurveda that is also based on immunomodulation i.e. to strengthen the body systems to make them refractory to infections. Besides, there will be a workshop for young scientists on diagnostic techniques “Dot immunobinding assay” in which about 15 young dynamic scientists will be selected and will be imparted training on principles, procedure and application of dot immunobinding assay with its practical utility in field conditions in diagnosis of animal and human diseases.

In this issue a review article is included on chaprons and their role in cancer vaccines. Besides, there are papers on immuno-diagnostics, immunopathology of pesticides and heavy metals and immunomodulation. Hope this issue will also be liked by the members and the scientific fraternity related to immunology. The editors are happy to inform the readers that a web site of the society and journal, with an aim to offer ready accessibility to various activities of the society at right at the readers desk. The web address is www.geocities.com/SIIP India.
News

1. Dr. R.S. Chauhan, Managing Editor and Secretary General, has been awarded with the **Shri Ramlal Agrawal National Award** for his research work on herbal immunomodulation.

2. Dr. Avdhesh Kumar, Dr. R.S. Chauhan and Dr. N.P. Singh have been awarded with the **“Dr. K.S. Nair Memorial Award”** by Indian Veterinary Association for their work on heavy metal induced immunotoxicity.

3. Dr. G.K. Singh, Prof. & Head, Deptt of Anatomy and Editor of the journal has been given the responsibility of Organizing Secretary to hold the “XVI Annual Conference of IAVA and National Symposium on “Animal Structural Dynamics to Improve Health and Production (8-10 Nov., 2001)”

4. Dr. B.P. Singh, one of the active member of the society visited USA and Denmark to attend international conferences and present paper on Immunopathology.

5. Dr. D.P. Singh, visited Denmark to attend the 10th International AITVM conference and presented paper on “Impact of pesticides pollution on veterinary Public health and food safety in India”.

6. Dr. B.P. Singh has got Nueffic scholarships to pursue higher studies in Utrecht University, the Netherlands.

7. Dr. R.S. Chauhan has written a book on “Illustrated Veterinary Pathology” which will be useful to the students, field veterinarians and teachers of Veterinary Science.

List of Conferences / Symposia/ Seminars

- 17-21 September 2001, International Conference Centre, Cairo, Egypt. World Veterinary Poultry Association XII International Conference on Current Developments and a prospects for Poultry Disease, Prevention and Control. **Contact:** Professor Dr. A.A.Sami Ahmed, PO Box 2399, Cairo, Egypt.

- 24-26 September 2001, Pune, India. The South Asian Association for Regional Co-operation (SAARC), 1st Poultry Conference and Exhibition in Pune, India **Contact:** 1st SAARC Poultry Conference “Kateshwara House”, Pune Sinhagad Road, Pune-411 030 India.

- 8-10 Nov., 2001, XVI Annual Convention of Indian Association of Veterinary Anatomists and National Symposium on Animal Structural Dynamics to Improve Health and Production at College of Veterinary Sciences, G.B. Pant University, Pantnagar-263145. **Contact:** Dr. G.K. Singh (05944-33061(O), 33705(R) 33473(Fax).

- 3-5 December 2001, Resistant Gram–Positive Infections. San Antonio Texas. **Contact:** Mr. D. Leshem, Suite 400,430 3rd Ave. New York, Ny 10017. USA.

- 14-15 Dec., 2001. Second Convention of Society for Immunology and Immunopathology and National Symposium on Immunomodulation in Health and Disease at College of Veterinary Science, G. B. Pant University Pantnagar 263 145, Uttaranchal. **Contact:** Dr. R.S. Chauhan [05944-34023(R), 34745(O) 33473(Fax)].

- 14-17 December ‘News 2001, Venice, Italy contact; Giuseppe Cornaglia, MD Institute of Microbiology University of Verona Strada Le Grazie, 8-37134 Verona, Italy.

- Feb. 2002, International Symposium on Leismaniasis Society of Laboratory Medicine Deptt. of Lab Medicine. AIIMS New Delhi-29. **Contact:** Dr. Sarman Sigh (011-652 8484, 6594764 Fax 6862663.

- 11-13, February 2002, Sydney, New South Wales Australia, 2002 Australian Poultry Science Symposium **Contact:** Poultry Research Foundation, University of Sydney Camden, NSM 2570, Australia.

- 11-14 March 2002, 10th International Congress on Infectious Diseases (ICID). **Contact:** ISID 181 Longwood Avenue, Boston, MA, 021 15.

- July 2002, XIV International Conference on AIDS **Contact:** Edifici Aplollo X, Balmes, 200 at 9,08006 Barcelona Spain.


- 6-10, September 2002 Bremen, Germany 11th European Poultry Conference **Contact:** (Scientific Programme) Prof. Dr. F. Ellendorff, Inst. F. Tierzucht und Tierverhalten Mariensee, Hollystrasse 10, 31535 Neustadt, Germany.

- 6-11 October 2002, 3rd International Workshop on the Molecular Pathogenesis of Marek’s Disease and the Avian Immunology Research Groups Meeting, **Contact:** MAREKS AIRG at target tours, PO Box 29041 Tel Aviv 61290, Israel.

- 10-14 August 2003, lillehammer, Norway, 14th European Symposium on Poultry Nutrition **Contact:** Norwegian branch of WPSA, C/o Centre for Poultry Science, Box 4377 Torshov N- 0402 Oslo, Norway.