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REVIVAL OF SUPPRESSED IMMUNE RESPONSE IN POULTRY BY "HAVI" SUPPLEMENTATION

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ABSTRACT

Faulty administration of pure Furazolidone feed additive led to immunosupression in a normally behaving layer flock aging 19 weeks at a public sector poultry farm at Quetta. At the age of 20 weeks, immunization was performed against Newcastle Disease by injecting Lasota strain (inactivated oil-based vaccine) and simultaneous inoculation with Live Lasota strain vaccine via the intraocular route. At the age of 23 weeks, flock comprising of 3,855 birds with 47 % egg production showed behavioral changes such as cyanosis of comb, respiratory rales, swelling of head and eyes, paralysis, diarrhea with greenish color, unstable production trend and increase in week shell egg laying. Despite all possible laboratory-supported remedial measures, the problem persisted varyingly, causing mortality up to 31 weeks and culminated in the flare up of Newcastle Disease. During this period of 8 weeks, 15.77 % mortality was observed. A day prior to the flare-up of Newcastle Disease, realizing the peak of distress and failure of all the then prevailing remedial measures, supplementation of "Havi" via drinking water was initiated as the last resort. "Havi" supplementation could not check the out break but proved most effective for suppressing mortality which was 5.27 % in the proceeding week after flare up and only 2.3 % by the end of 35th week, the time "Havi" supplementation terminated. A week after flare up, egg production declined to 24 %, then increased to 53 % at the disruption of "Havi" and later on attained a peak of 78 %. Two weeks after the flare up of Newcastle Disease, "Havi" supplementation proved ever effective in checking mortality, suppressing morbidity and accelerating egg production. Antibody profiles against Newcastle Disease at that stage were at their peak but symptoms continuously prevailed. Flock was revaccinated with Newcastle Disease live virus Lasota strain vaccine via intraocular route. This time response was ever astonishing and in the proceeding 96 hours signs/symptoms disappeared and flock started performing as per required parameters.

INTRODUCTION

The term immunosuppression refers to improper functioning of the non-cellular (antibody) and cellular components of the immune system. This can result in the development of limited protection from the vaccination and an excessive vaccine reaction with increased morbidity and mortality. Immunosuppression has historically cost the poultry industry big loses due to increased mortality and low productivity. In addition, immunosuppression has had a negative impact on the ability of the poultry industry to process chickens due to associated health problems (6). Poultry may be immunosuppressed due to infections with different pathogens, consumption of feed with high levels of mycotoxins, and medication when applied wrongly. Prominent signs of nitrofurazone toxicity in chicks include depression, ruffled feathers, growth retardation, nervous symptoms and hyper excitability (8,10). Immunosuppressed flocks cannot express their full potential in terms of performance and welfare. The increased use of antibiotics and chemicals to fight secondary infections is a major concern for human health as well. Immunomodulators, defined in broader sense, are agents that affect the immune response of which the effect may be stimulatory or suppressive. Traditionally, immunomodulators, are considered only as adjuvants or immunosuppressives to be used in autoimmune disorders or to prevent graft rejection. However, based on the recent developments in immunology a much broader role can now be visualized for immunomodulators in therapeutics (11). The role of these modulatory agents may be threefold: i)

enhancement of phagocytosis of foreign agents, ii) restoration of impaired immune function, and iii) treatment of infection(s) without exerting selective pressure on microbial populations, which is an inherent problem with antibiotic therapy. There are many situations in veterinary medicine where it is desirable to enhance immune response, such as the enhancement of resistance against infection and the treatment of immunosuppressive conditions. Immunomodulators or immunostimulants vary according to their origin, mode of action, and the way they are used. They include bacteria and bacterial products, complex carbohydrates, immunoenhancing drugs, vitamins, and cytokines (13). The present study elaborates the revival of suppressed immune response in a poultry flock of a public sector farm through "Havi", an immunomodulator the author discovered during his research on over two million birds in his private laboratory in late Nineties.

METERIALS AND METHODS

Pullets at the age of 19- week experienced Furazolidone toxicity in a public sector poultry farm at Quetta. At 20-week age, routine immunization against Newcastle Disease (ND) was performed by injecting Lasota strain inactivated oil based vaccine with simultaneous inoculation of Live Lasota strain via the Intraocular (I/O) route, as already practiced by many researchers (12, 14). At the age of 23- week, same flock, comprising of 3855 birds with 47% egg production, showed behavioral changes such as listlessness, cyanosis of comb, respiratory rales, swelling of head and eyes, paralysis, inconsistent diarrhea with greenish coloration and unstable production trend with increased weak-shell egg laying, observed by other workers as well (2, 9). Serum antibody profiles against ND, based on haemagglutination inhibition test (HI) using 8 haemagglutinating (HA) units (3) were ascertained. Morbid material i.e. lungs, brain and spleen were processed for the extraction of antigen. The HA ability of the extracted antigen was explored by the agglutination of 0.75% chicken erythrocytes, following the procedure already mentioned by some workers (7).

On the basis of clinical picture and the serological/diagnostic tests, the flock was vaccinated immediately against ND with live virus Lasota strain vaccine via the I/O route. No significant improvement in clinical picture emerged and the problem persisted up to 31-week. During this span, relying on clinical picture and fore-mentioned serological/ diagnostic tests, the flock was vaccinated twice against ND at the age of 25 and 29-week with Lasota strain live virus vaccine via the I/O route. During course of the problem, flock was regularly monitored for secondary bacterial invaders and therapeutic aids with full laboratory support provided to suppress opportunist pathogens. A day before flare up of ND at the termination of 31st week, upon realizing the agony and collapse of all the then prevailing remedial measures, supplementation of "Havi" at the rate of 2 gm./10 lit. of drinking water was initiated as a last option. At the completion of 33rd week, ND antibody status through HI was ascertained and HA antigen from morbid tissues was extracted again. The flock was vaccinated against ND with Lasota strain live virus vaccine via the I/O route during the 34th week.

RESULTS AND DISCUSSION

During 8 weeks of the problem (23rd to 31st week) 15.77% mortality was observed. Post ND flare up mortality in 32nd week was 5.27%, which, in the next 3 weeks, declined to 2.3% (Fig. 1). Egg production, at the age of 23 weeks was 47%, which, at the termination of 31st week improved to 56%. Post ND flare up production abruptly declined to 24% during 32nd week. At the end of 35th week, 53% egg production was recorded, which later on further augmented to 78% at the termination of 37th week (Fig. 2). Serum antibody profiles against ND, based on HI test revealed geometric mean titer (GMT) (5) of 22,19,27,7,238,48 and 207 at the flock age of 23,25,29,31,33,34 and 37 week respectively (Fig. 3). HA antigen/virus from morbid material was detectable till suppression of symptoms during 34th week. HA titer of the antigen extracted ranged between2^2 to 2^3.
The problem under these circumstances can be divided into two phases i.e.

i) re-"Havi" supplementation phase (from 23rd week to the second last day of 31st week), and, ii) post-"Havi" supplementation phase (a day before termination of 31st week to the completion 35th week). The clinical picture, during the course of problem remained indicative of the involvement of extremely virulent virus of ND (VVND) and found in conformity with many reports (2, 9) except post ND flare

up morbidity and mortality patterns. Sero-diagnostic assays against ND based on HI and extraction of HA virus from morbid material strongly support that pre-"Havi" supplementation phase was the immunosuppressed phase, as immune response, despite repeated vaccination at 23rd, 25th and 29th week, could not be triggered. Had the flock been not immunosuppressed, concurrent vaccination with injection of ND inactivated Lasota virus vaccine and ND live virus Lasota strain via the I/O route would have yielded productive and significantly protective ND HI antibody titers (1, 4) by the completion 23rd week. With maximum inputs, mortality during the phase could not be reduced from 15.77%. In the post-"Havi" supplementation phase, the supplementation very effectively suppressed post-ND mortality. This trend is in absolute disagreement with the previous reports (2, 9) and could be, in part, due to the triggered immune response shown by the flock as a result of "Havi" supplementation. At the verge of ND out break, despite a peak decline of ND HI antibody profile of the flock to GMT 7, no immunization against ND was practiced. During 34th week, proper immune response was anticipated as a result of "Havi" supplementation and in the light of flock's performance. Therefore, vaccination with live Lasota ND virus via I/O route was performed. Disappearance of ND signs and symptoms, in the subsequent days, indicated revival of suppressed immune response that, later on was confirmed serologically.

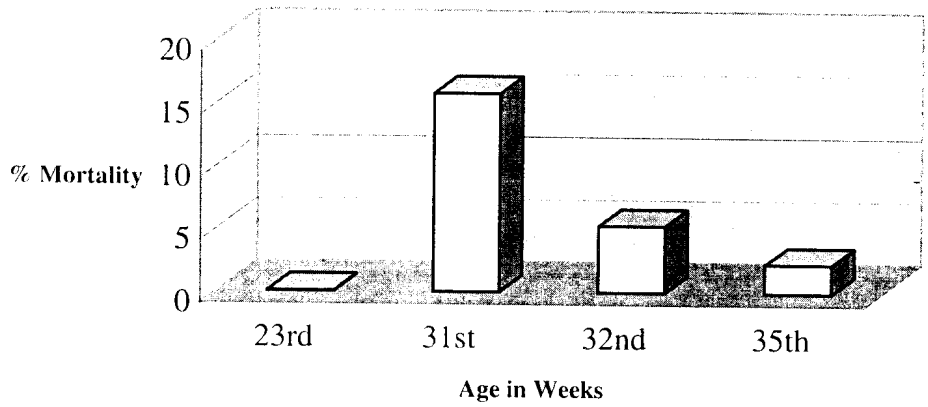
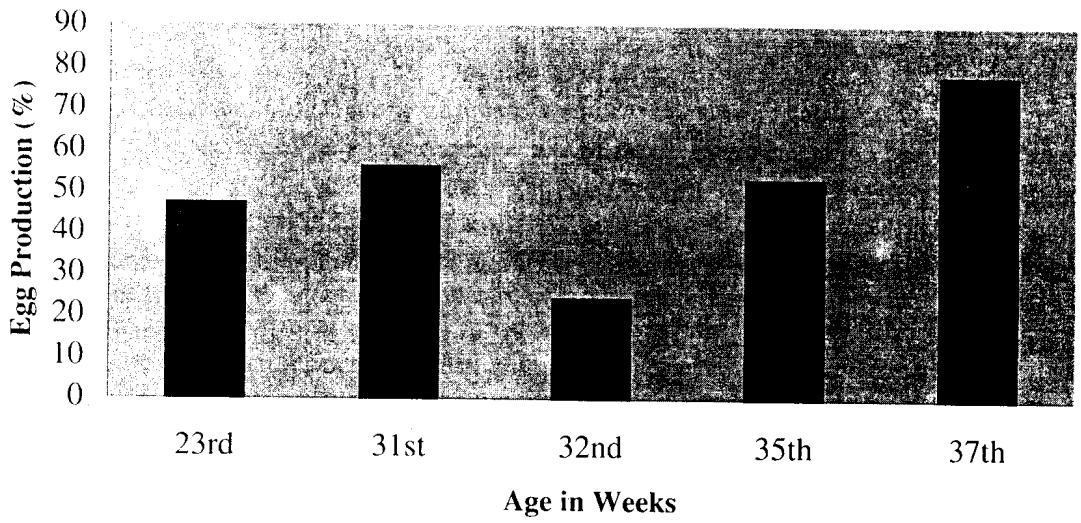


Fig. 1. Mortality Trend During the Course of Problem.



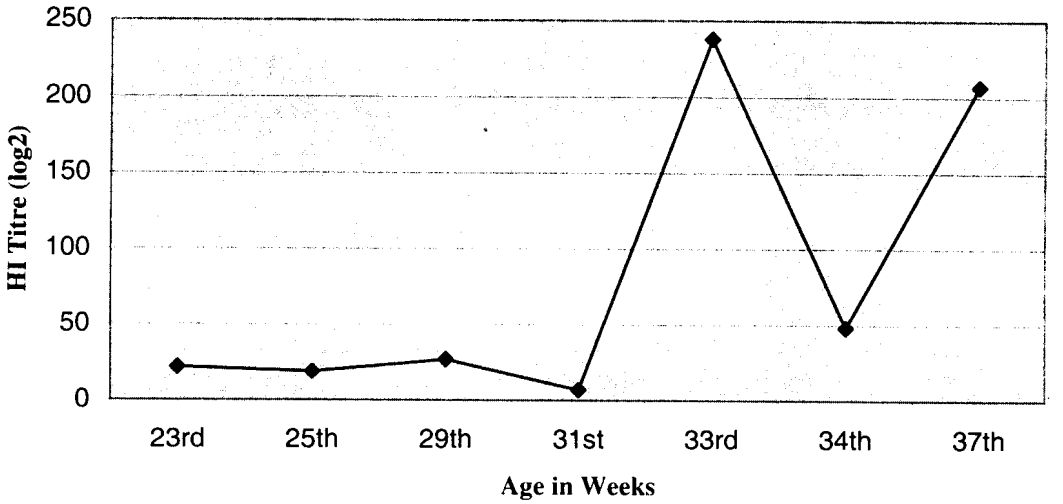


Fig. 3. Serum Antibody Profiles Against ND

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