VACCINATION TRIAL FOR EGG DROP SYNDROME - 1976 (EDS -'76)

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ABSTRACT

A vaccination trial for Egg Drop Syndrome - 1976 (EDS -'76) was conducted in commercial layers. The commercial vaccine used in this study was found protective against a local isolate. The birds in group I which received a booster dose three weeks after first vaccination did not excrete any virus after challenge throughout the observation period but birds in group II which received single vaccination alone excreted the virus upto 9 days PI. There was no egg abnormalities detected in vaccinated birds. The virus excretion in control group was present upto 15 days PI and the egg abnormalities were noticed 25 days PI. The post mortem examination and histopathological findings were supportive of EDS -'76 virus infection in control group.

KEY WORDS: Egg Drop Syndrome - 1976, Inactivated Vaccine, Serology, Virus Shedding.

INTRODUCTION

Egg drop syndrome - 1976 (EDS -'76) is a major cause for loss of egg production upto 40 per cent and laying of thin shelled and shell less eggs by apparently healthy birds. The syndrome is caused by an adenovirus with transmission occurring vertically and horizontally. It was first reported in Netherlands by Van Eck et al.(1976) and has since been reported from numerous countries world-wide. In India the disease was reported by Mohanty et al.(1984).

Even though vaccines are available in the market to control this syndrome there is no enough data on the schedule of the vaccination and virus shedding pattern after vaccination from the vaccinated flock. Hence this study was designed to standardize the vaccination schedule in commercial layers.

MATERIALS AND METHODS

The vaccine 'PROLOCK' of Egg drop syndrome 1976 was purchased from Indovax Pvt. Ltd., Hissar. The vaccine contains inactivated EDS virus strain 127 in stable oil emulsion.

Ten-week -old layer birds purchased from a commercial farm, maintained at Veterinary College and Research Institute, Namakkal were used in this study. The birds were grouped into two groups namely G1and G2, each containing 10 birds and 5 kept as control.

Before vaccination serum samples were collected from all the birds and subjected to HI test. All the 20 birds in each group (G1and G2) except control received 0.5 ml of EDS -'76 vaccine intramuscularly at the age of 14 weeks. At the age of 17 weeks the group I alone received a booster dose of 0.5 ml vaccine intramuscularly. After vaccination all the birds including control were subjected to serology at periodical interval.

At the age of 24th week all the vaccinated and unvaccinated control birds were challenged with 0.5 ml of local isolate of EDS -'76 virus having a titer of 100 $TCID_{50}$ orally and intra ocularly. The birds were monitored upto 21 days after challenge for shedding of the virus in feaces and for antibodies in serum by HI. The flock was observed for egg abnormalities.

Cloacal swabs and faeces were collected in HBSS and stored at -20°C. The faeces were made into 10% (w/v) suspension and mechanically shaken to ensure uniform mixing and centrifuged at

10,000 rpm for 15 min. (Kumar et al., 1992). The upper one third of the supernatant was filtered through 0.2 m syringe filter (Sartorius) and was used as inoculum for infecting duck embryos and conduct of HA test and AGPT to detect shedding of the virus. After 7 and 21 days of post challenge the serum was collected from all the birds and tested for antibodies by micro HI test as per the procedure described by Mc Ferran et al. (1977). Three of control birds and five of the vaccinated birds were sacrificed 15 days PI and examined for the presence of gross lesions in reproductive tract. Tissue samples from the oviduct and uterus were collected and processed for histopathological examination.

RESULTS AND DISCUSSION

Serum samples collected from all the layer birds before vaccination were negative to EDS -'76 antibodies indicating that the flock was free from EDS -'76 infection.

In vaccinated birds the sero conversion noticed 14 days after vaccination with the mean HI titer of $\log_2$ 7/25 µl. In group I consistent mean HI titer of $\log_2$ 9 /25 µl/ was present prior to challenge. In group II mean HI titer of $\log_2$ 6/25 l/ was present prior to challenge.

The inoculated hens of group I and II showed no clinical signs of illness and egg abnormalities. The control birds showed temporary diarrhoea and impaired production. No change in consumption of feed was observed in vaccinated and control birds. The control birds developed antibody titer after seven days indicating the infection.

The birds in group II and control group started excreting the virus in feaces 3 days PI. The birds in group I did not excrete the virus. This was confirmed by HA test and AGPT. The supernatant of the pooled fecal sample suspension of group II and control group produced a HA titer of $\log_2$ 4 / 25 l and $\log_2$ 10 / 25 µl respectively at 6th day post challenge. When inoculated into embryonated duck eggs both group II and control group produced high HA titers of $\log_2$ 10 / 25 µl and $\log_2$ 18 / 25 µl respectively.

The birds in group I and II produced normal eggs without any abnormalities. The control group produced thin shelled, shell less and misshapen eggs after 25 days PI. There were no changes in the internal quality of eggs laid by control group.

On 15th day PI two control birds were sacrificed which showed gross lesions of slightly oedematous uterus. Histopathological examination of oviduct revealed lymphoid aggregates in lamina propria of magnum, cellular infiltration and atrophy of tubular glands of infundibulum. In uterus atrophy of the shell glands with focal lymphoid aggregation was noticed.

This trial was conducted to assess the protective efficacy of commercial vaccine against local isolate. The result of the trial indicates that commercial vaccine protects birds from local isolate. But the virus excretion and serology studies revealed that single vaccination, as suggested by manufacturer to be insufficient.

Rampin et al.(1980) reported the protective HI titer for EDS -'76 as $\log_2$ 6. In the present study the group I which received booster dose at 17th week gave a consistent mean HI titer of log2 9 till 24th week and resisted the challenge well without virus excretion. But the group II birds which received a single vaccination at 14th week showed comparatively less antibody titer and the level was also not maintained till the challenge. The virus excretion was present immediately after the challenge. Though both the groups resisted the challenge, it may not be possible for the single vaccination to protect the birds against drop in egg production throughout the production period especially at peak production when the birds are exposed to severe stress.

Kumar et al.(1988) found that single vaccination against EDS -'76 at the age of 20th week yielded a peak HI titer of $\log_2$ 14 six weeks after the vaccination and persisted upto 44th week of age. This

result was not in correlation with the present result because at the age of 24th week itself there was reduction in antibody titer.

Vanisree et al.(1998) found that the booster inoculation after 4 weeks of first injection had a conspicuous effect by increasing the duration of immunity upto 24 week post vaccination, which endorses the present finding.

The virus excretion study in the present work revealed that the birds in group I was not excreting any virus after challenge. The birds in group II excreted the virus upto 9 days and control birds upto 15 days. This finding indicates that the single vaccination may not be sufficient to protect the birds in group II from EDS -'76 viral infection throughout the production period especially at peak production.

Challenge with virulent EDS -'76 virus resulted in mean HI titer of $\log_2$ 10/25 µl in vaccinated birds. The magnitude of the antibody response following challenge varied with the serum antibody titer prior to challenge. In the birds, whose antibody levels were initially nil or low, the increase in serum antibody titer were substantial. The birds with moderate levels of antibody before challenge had less dramatic increase. The lowest post - challenge titers were seen in birds that had high levels of antibody before the challenge. This is in agreement with the findings of Baxendale et al. (1980) who, in field studies, observed a similar rise in antibody titers following the challenge in birds with low or nil antibody titer.

No egg abnormalities were noticed 25 days post challenge in both the vaccinated groups. This means that the birds with HI titers of $\log_2$ 6 and above were protected from the disease, which is in accordance with Asi and Iyisan (1990).

In control group the birds started to produce abnormal eggs only after 25 days PI. This result does not agree with the observations of Brugh et al.(1983) and Yamaguchi et al.(1980). They observed marked changes in external quality by 13 days PI. The virus upon challenge in control group was excreted through cloaca for 15 days PI and induced HI antibody titer of $\log_2$ 5 per 25 µl after 7 days PI which is in accordance with the findings of Swain et al.(1993).

The results of histopathological examination are in accordance with Moorthy et al. (1987) and Chetty et al.(1987).

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BEST POSTER AWARDS TO VET SCIENTISTS

Following Research papers were adjudged as the best posters from the Faculty of Veterinary Science & Animal Husbandry, AAU, Anand, in Poster Sessions on Animal Health (1-3) and Animal Biotechnology (4-5) of the National Seminar on "Advances in Animal Health & Application of Biotechnology and 1st Annual Convention of the Society for Veterinary Sciences and Biotechnology (SVSBT)" jointly organized by the SVSBT, Indore and College of Veterinary Science & AH, AAU, Anand - 388 001 on 9th March 2013 at the Auditorium of BA College of Agriculture. The authors were awarded certificates in the plenary session.

1. "Febrile Conditions Alter the Pharmacokinetics of Moxifloxacin following its Intramuscular Administration in Sheep" by K.A. Sadariya, S.D. Patel, J.B. Patel, S.K. Bhavsar and A.M. Thaker

2. "Monthly Pattern of Inseminations and Reproductive Health Disorders in Dairy Bovines of Middle Gujarat" by K.K. Hadiya, J.A. Patel, R.G. Shah, M.T. Panchal and A.J. Dhami

3. "Evaluation of Efficacy of Diagnostic Techniques in Canine Generalized Demodicosis" by D.S. Nauriyal and Jigar Patel

4. "Use of IFN-Gamma Release Assay in Combination with Tuberculin Skin Test for Screening of Bovine Tuberculosis in Indian Cattle" by Sagar S. Vyavahare, Maroudam Veerasami, Dipankar Das, Samir K. Rana, V.A. Srinivasan and M.K. Jhala

5. "LAMP Based Detection of Pasteurella Multocida in Outbreak of Fowl Cholera in Emu" By M.P. Bhimani, B.B. Bhanderi and A. Roy