Med. J., Giza Vol. 45, No. A. (1997): 527-530.

FIELD TRAILS WITH HYPERIMMUNE EGG YOLK TO CONTROL LOSSES IN OUTBREAKS OF VERY VIRULENT INFECTIOUS BURSAL DISEASE IN VACCINATED COMMERCIAL LAYER PULLET FLOCKS

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Received: 15/ 7/ 1997
Accepted : 23/ 7/ 1997.

SUMMARY

Field trails to control serious losses from very virulent infectious bursal disease (vvIBD) outbreaks in vaccinated layer pullet flocks by parenteral administration of hyperimmune egg yolk preparation were carried out. The results are presented and discussed.

INTRODUCTION

Since the emergence of very virulent infectious bursal disease virus (vvIBDV) in Egypt in 1989, which caused devastating losses especially in commercial layer pullets (El-Batrawi, 1990; Ahmed, 1991), extensive use has been made of commercial live IBDV vaccines of the standard "intermediate" types from different manufacturers either alone or in combination with inactivated oil-based IBDV vaccines. However, all attempts to effectively immunize pullets derived from parents that have been vaccinated with both live and inactivated IBDV vaccines have been frequently unsuccessful.

Field observations have shown that suboptimal management, hygiene, and biosecurity measures prevalining in many farms helped early challenge exposure before effective vaccinal immunity has had time to develop satisfactorily and are among the main causes of vaccination failure.

Previous reports (Houjing, 1992; Biqiong, 1993) have shown the effectiveness of hyperimmune egg yolk (HEY) in prevention and control of IBD under field conditions. Therefore, in an effort to control serious losses from vvIBDV outbreaks in vaccinated layer pullet flocks, HEY preparations were tried.

MATERIAL AND METHODS

Hyperimmune egg yolk (HEY):

Mycoplasma-free HEY preparations from layer parent flocks diluted v/v in phosphate buffer saline (pH 7.2) were used. These preparations were bottled in 500-ml sterile bottles under aseptic conditions and kept frozen until used. They contained approximately 2500-3500 IDEXX ELISA units and had 2^7-2^{10} precipiten titer.

Layer pullet flocks:

A total of 96 Hy-Line pullet flocks, each of 10-45 thousand birds, vaccianted 2-5 times with various standard commercial IBDV vaccines by different routes at the age between 1-5 weeks, were involved in the trails. Twenty-two flocks were affected and could be treated with 0.5 ml/bird of HEY given subcutaneously or intramuscularly within 1-3 days after onset of the first IBD mortality, a similar number was affected but nontreated flocks which served for comparison, and 52 flocks were non-affected and nontreated.

RESULTS and DISCUSSION

Data summarized in Table (1) show that IBD mortality onset in the affected flocks occurred at an age between 27 and 50 days. The mortality rates encountered among both HEY-treated and nontreated flocks were quite variable and in some cases conflicting suggesting that rather other interacting factors than mere HEY treatment were involved, which governed the outcome of IBD mortality in these flocks. The age at onset of mortality, the vaccination schedule adopted and type of vaccines used, time of intervention with treatment after onset of first IBD mortalities, housing system and pullet variety were among the interacting factors. Unfortunately, the number of flocks representing each of these factors was frequently small to allow analysis and exact conclusion.

Generally, apparently slight difference was found in the average overall mortality between treated and nontreated pullets, viz 9.5% versus 10.3% in white layers, respectively, and 11.1% versus 14.9% in brown layers. However, considerable differences were frequently encountered in the average mortality amounting to approximately 50-87% when comparison was made between treated and nontreated flocks raised under similar housing system and vaccination schedules, and were of similar age groupat IBD onset, indicating the effectiveness of treatment. Early intervention with HEY after onset (within 24 hours) was generally more effective than late (2-3 days). Moreover, it was found that the onset of IBD at a young age (27-35 days) was accompanied as a rule by higher mortality rate, suggesting early challenge exposure before effective vaccinal immunity has had time to develop satisfactorily.

Noteworthy is the finding that in 52 other investigated flocks adapting similar vaccination schedules and types of vaccines and raised under similar conditions were completely protected against IBD mortality. Challenge exposure of many of these flocks was assumed on the basis of

Table (1) : EFFECT OF HYPERIMMUNE EGG YOLK INOCULATION ON MORTALITY FROM vvIBD OUTBREAKS IN VACCINATED COMMERCIAL LAYER PULLET FLOCKS

	EGG YOLK-TREATED FLOCKS									NON-TREATED FLOCKS							
Layer type	Frequency of vaccination	No. of flocks & Housing	Age at disease onset (Days)			Treatment after disease onset	Mortality %			Frequency of vaccination	No. of flocks & Housing	Age at disease onset (Days)			Mortality %		
	(No.)	system	Min.	Max.	Av.	(Days)	Min.	Max.	Av.	(No.)	system	Min.	Max.	Av.	Min.	Max.	Av.
White		1/FL	-	-	43	2	-	-	2.4	2	1/FL	-	-	37	-	-	18.5
	2	1/CA	-	-	36	2	-	-	20.1								
		2/FL	33	39	36	2	1.4	6.4	3.9		2/FL	34	39	36.5	4.6	32.3	18.3
	3	4/CA	31	44	38.5	1-3	1.0	13.1	8.1	3	4/CA	35	45	40.0	1.2	36.5	16.4
		3/FL	34	40	37.7	1-2	1.9	15.1	7.8		3/FL	35	46	41.7	2.3	15.0	6.1
	4	4/CA	35	50	42.3	1-2	0.9	34.4	10.5	4	1/CA	-	-	37	-	-	31.6
		1*/CA	-	-	33	2	-	-	2.7		7*/CA	27	44	33.1	3.4	28.7	17.0
	n =16					Av. Mortality = 9.5%				n = 18					Av. Mortality = 10.3%		
Brown	2	1/CA	-	-	28	1	-	-	5.6	2	1/CA	-	-	31	-	-	24.4
	3	4/CA	32	45	38	1-2	0.9	15.8	9.9	3	1/CA	-	-	29	-	-	26.6
	4	1*/CA	-	-	29	3	-	-	17.4	4	1*/CA	-	-	30	-	-	12.5
										5	1*/CA	-	-	44	-	-	0.6
	n = 6					Av. Mortality = 11.1%				n = 4					Av. Mortality = 14.9%		

CA = Cage
FL = Floor
* Vaccinations included one dose of inactivated oil-based vaccine.

the occurrence of the disease in only one of two flocks of the same hatch on the same farm. This led us to conclude that improper handling and/or administration of IBDV vaccines also contribute to vaccination failure.

The existence of variant or subtype IBDV strains in the field, which may account for vaccine failure in some of these flocks can not be completely ruled out, since results of few investigations utilizing cross-neutralization and agar-gel precipitation tests with polyclonal and monoclonal IBDV antibodies, respectively, may support this view (El-Sanousi et al., 1994; Sultan, 1995; Saif Edin et al., 1996).

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