POTENCY OF MAREK'S (MD) VACCINE

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SUMMARY

Some unsuccess of MD vaccination still found in the field. Especially in Indonesia, vaccination failure some times are caused by handling of the MD vaccines, skill of the personal and the limitation of MD vaccine type must be chosen by the user.

This paper try to solve their problem for knowing the potency of MD vaccine (three types) and cross reactivity among MD vaccine types.

INTRODUCTION

Marek's Disease is characterized with tumors in visceral organs of chicken which introduced by Dr. Jozsef Marek in 1907 (Payne, 1985). Tendency of disease is occured in chicken more than 20 weeks old (Ekperigin dkk, 1983) and in Indonesia, Marek's Disease is found in 1951 which almost spread in all provinces.

Recently Indonesia government had imported Marek's vaccine for anticipating the disease. Three types of MD vaccines have been known. There are type I (CVI), type II (SB-1) and type III (HVT). Relating with packaging, the vaccines are "cell associated" (frozen package) and "cell-free" (freeze dried package). Some producers combine the MD vaccine with their types or with the other poultry vaccine in one vial.

In the field, the breeder and veterinarians (Technical Service) still find some MD vaccination failures and they confuse to choise the best type for MD vaccination. Therefore, Indonesian Veterinary Drug Assay Laboratory performed primarily research for MD vaccine in Potency Test.

MATERIAL AND METHOD

A. *Vaccines :*

We used "cell associated" vaccine : CVI (type I) and SB-1 (type II), and "cell-free" vaccine : HVT (type III).

B. *Chicken and Sera :*

Specific Pathogen Free (SPF) day old chick were hatched in our Laboratory, distributed from SPF eggs of PT. Vaksindo Satwa Nusantara, Bogor.

Day old chick were devided into 3 groups (10 birds per group) and were vaccinated with type I, type II and type III with 0.2 ml/dose, in the subcutaneous route. The chicken were reared until seven weeks in different isolator. Sera sample were collected every weeks from the third week to the seventh week post vaccination.

Positife serum control type I and type III were received from NVAL-Japan while positive serum control type II and negative serum were produced in our laboratory.

C. *Infected cells :*

Monolayer of primary Chick Embryo Fibroblast (CEF) cultures on the coverslip contained in the dishes (ϕ 45 x 15 mm) were infected with 8×10^4 PFU/dish of MD vaccine of each type. After incubating for 1 – 2 days and resulted more than 75% Cyto-Phatic Effect (CPE), the cells were harvested.

D. *Indirect IFAT (Immuno Fluorescence Antibody Technique) :*

Indirect IFAT are performed with Purchase methode with slight modification (Purchase, 1985).

D.1. Antibody detection :

Serum from three groups of 3. 4. 5. 6. 7 weeks post vaccination are diluted 40 times and inoculated in homolog infected cell. There were incubated at 37°C for 1 hour and washed before adding four unit FITS (Fluorescein-Isothiocyanate rabbit anti chicken immunoglobulin Seikagaku-Lab. Japan). After incubating with secondary antibody at 37°C for 45 minutes, there were rinsed in PBS^{-} and observed under ultraviolet microscopy with adding glycerin buffer.

D.2. Cross reaction among MD vaccine types:

The test was carried out the 7 weeks post vaccination serum of the three types MD vaccines. Those sera were inoculated on homolog and heterolog infected cell either.

RESULT AND DISCUSSION

International Minimum Standard for MD vaccine are contain $\geq$ 1000 PFU for cell associated and $\geq$ 2000 PFU for cell-free vaccine.

More than 80% of vaccinated chicken must have 40 times minimal antibody titer in their bodies. In this study showed that the 3 types of MD Vaccine had different period on antibody production.

As shown in Table 1, the group chicken which received MD vaccine type II produced suffient antibody in 6 weeks, while for group MD type I and III have taken 5 and 3 weeks respectivelly. Some authors found polyvalent give more protection compare with bivalent and monovalent MD vaccine (Witter, 1982, Witter and Lee, 1984, Witter dkk, 1984), also bivalent (combination type II and III) give superior result compared with monovalent MD vaccine (1).

Table 1. Potency of MD Vaccine with Indirect IFAT

Vaccine Type	Virus Content	Correlation of serum positive tested*				
		3 weeks**	4	5	6	7
I	2840	0/10	1/10	10/10	9/10	9/10
II	1580	0/10***	1/10	6/10	10/10	9/10
III	1840	0/10	10/10	9/10	10/10	10/10

* : Serum are diluted 40 times
** : Chicken age (post vaccination) in weeks
*** : Proportion of total serum positive/total serum tested

In MD vaccination programme, some researchers suggest to use different MD type for each different generation of great parent stock, parent stock also commercial stock in order to eliminate neutralization of maternal antibody.

Using five representative serum from chicken after 7 weeks post vaccination of MD type I, II and III are resulted in table 2.

From the second trial, it can be seen some serum can give cross reaction using homolog and heterolog antigen although in the low titer (Fig.1).

Table 2. Titer of 5 representative chicken serum with IIFAT

Vaccine Type	Serum titer		
	Type I	Type II	Type III
Type I	40 160 80 80 80	<40 <40 <40 40 40	<40 <40 <40 <40 40
Type II	<40 <40 40 <40 <40	40 40 40 40 40	<40 40 <40 40 80
Type III	40 40 <40 <40 <40	40 40 40 <40 <40	40 80 80 80 260

* : 7 weeks post vaccination

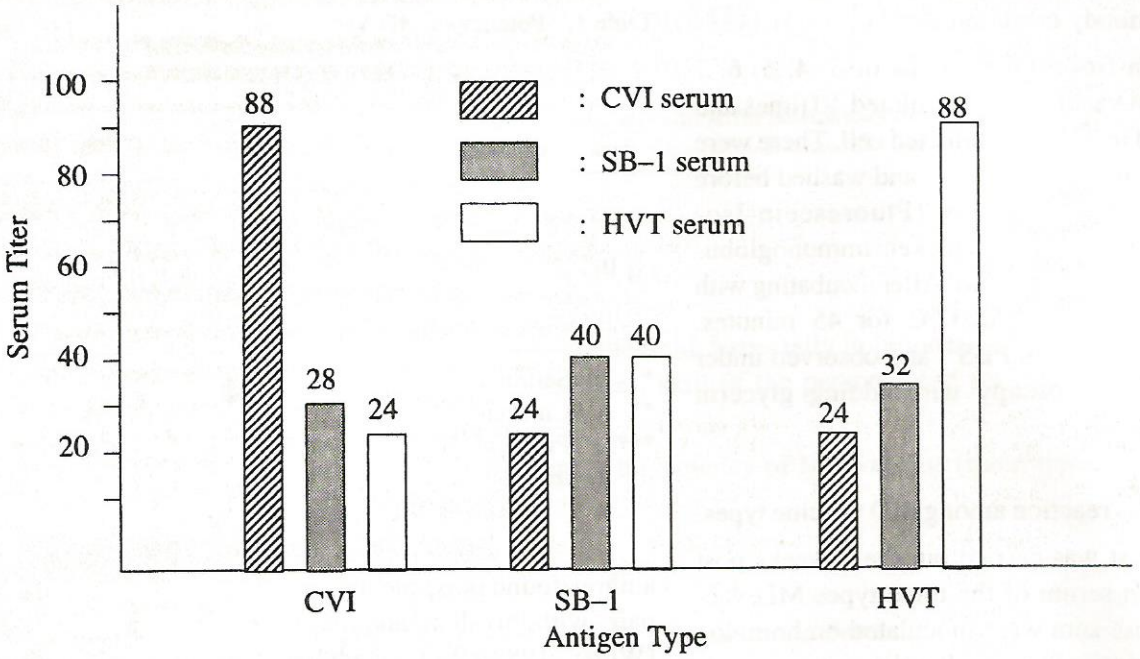

Fig. 1. Cross reaction among serum against MD-antigen type

Resulting of cross reaction it caused by each MD virus has "cross reactive determinants" for the other MDV type (Witter dkk, 1984).

CONCLUSION

a. Potency of MD vaccine

Sufficient antibodies $\geq$ 80% from vaccinated chicken are produced for 5 weeks from type I and 6 and 3 weeks from type II and III.

b. Cross reaction MD vaccine

It has shown there are cross reaction from each type of MD vaccine although in small scale relatively.

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