

## **EFFECT OF "IVERMECTIN" ON THE IMMUNE RESPONSE OF RABBITS VACCINATED WITH RABBIT HAEMORRHAGIC DISEASE VIRUS VACCINE**

**BY**

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### **SUMMARY**

***To study the effect of ivermectin on the immune response of rabbits vaccinated with rabbit haemorrhagic disease vaccine; groups of rabbits were subjected to treatment with ivermectin pre, simultaneously or post vaccination .Results of serological response as well as challenge test indicated neither suppression nor enhancement of the immune response compared with the control groups induced by ivermectin preparation.***

### **INTRODUCTION**

Rabbits are raised for a variety of purposes including meat and fur production. They also used as a laboratory animals. Moreover, pure bred show animals are raised as a hobby and rabbits of all shapes and colours are kept as pets (Lieve et al., 1988).

Rabbit haemorrhagic disease is among the main important viral disease affecting rabbits; the disease is a highly contagious characterized by acuteness; haemorrhagic lesions and high lethality, the disease was recorded for the first time in China in 1984 by Liu et al. (1984), Cao et al. (1986) and Du et al. (1991). In Egypt, the disease was recorded for the first time in Sharkia province by Ghanem and Ismail (1992).

Control of the disease takes place in Egypt using inactivated tissue vaccine giving a satisfactory result after Daoud et al. (1998)

Ivermectin is a strategic anti-parasitic preparation in rabbits breeding as it is widely used for treatment and prophylaxis of parasitic infections specially mange.

This study was planned to indicate the effect of ivermectin on the immune response of rabbits vaccinated against haemorrhagic disease.

## **MATERIAL AND METHODS**

### **Vaccine:**

Inactivated tissue vaccine against haemorrhagic disease of rabbits prepared in aluminum hydroxide gel locally in Veterinary Serum and Vaccine Research Institute. Each rabbit was vaccinated subcutaneously with 0.5 ml containing 1024 units.

### **Challenge virus:**

A virulent strain of rabbit haemorrhagic disease virus containing  $10^3$  LD<sub>50</sub>/ml was used as challenge virus for vaccinated and control groups 3 weeks post vaccination.

### **Ivermectin:**

-- 10% W/V sterile solution of ivermectin.M.H.Reg. No. 461/89 vet, manufactured by (ADWIA) was used at a rate of 0.1 ml/kg body weight as described by the manufacture instructions.

### **Experimental design:**

Sixty White New Zealand rabbits of about two months old each of approximately two Kgs were used in this study, the animals were kept in isolated disinfected wire floored cages and fed pelleted ration. Rabbits were found seronegative for rabbit haemorrhagic disease antibodies after 10 random blood samples examination by haemagglutination inhibition test. The animals were divided into 6 equal groups each of 10 rabbits and were treated as follows:

Group 1 → treated with ivermectin 3 days before vaccination.

Group 2 → treated and vaccinated in the same day.

Group 3 → treated 3 days post vaccination.

Group 4 → vaccinated non-treated.

Group 5 → treated non-vaccinated

Group 6 → non-treated non-vaccinated.

### **Haemagglutination inhibition test (HIT)**

HIT was performed according to the method described by Pu et al. (1985)

## **RESULTS AND DISCUSSION**

Rabbit breeders may face a sophisticated problem as rabbits may harbour more than one disease at the same like parasitism and rabbit haemorrhagic disease and the question is "What can be done?", starting treatment with ivermectin or vaccination with rabbit haemorrhagic disease vaccine or simultaneously treatment and vaccination at the same time.

The results of serological response as displayed in Table (1) and Fig.(1) revealed that no substantial differences in the HI antibody titers were found between the different vaccinated groups as the minimum values was  $\log_2 4$  that

recorded at the 1<sup>st</sup> week post vaccination for the 1<sup>st</sup> group (treated 3 days before vaccination) whereas the maximum level of titer log<sub>2</sub> 9 was recorded at the 3<sup>rd</sup> week post vaccination for groups (2, 3 and 4). However, the slight low values of HI antibody titer of the 1<sup>st</sup> group comparing with the other vaccinated groups considered none marked. Obtained HI antibody titers were protective against the virulent challenge virus as represented in Table (2) where the protection percentage were 100% for all group treated and vaccinated (groups 1, 2, 3 and 4). These results agree with that of Simon et al. (1993) where they found that a titer of >20 HI units gave full protection against RHDV.

From the aforementioned results it could be concluded that treatment with ivermectin prior, simultaneous or post vaccination with rabbit haemorrhagic disease vaccine had neither suppressive nor enhancement effect on the immune response. This conclusion disagree with that obtained by Fathia (1983) where she found that administration of ivermectin increased the immune response of rabbits and sheep vaccinated with pulpy kidney vaccine. The results also disagree with that that of Alkhafaji and Alfarwachi (2000) where they found that in experimental application with ND virus as an antigen in rabbits previously treated with ivermectin induced low antibody titer indicating inhibition of humoral immunity in the ivermectin group.

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**Table (1) The geometric mean  $\log_2$  of HI antibody titer against rabbit haemorrhagic disease vaccine**

Groups	Weeks post vaccination			
	1 <sup>st</sup> . week	2 <sup>nd</sup> . week	3 <sup>rd</sup> . week	4 <sup>th</sup> . week
Group 1	4	6	8	7.9
Group 2	5	7	9	8.8
Group 3	5.5	7	9	8.6
Group 4	5	7	9	8.5
Group 5	00	0	0	0.0
Group 6	00	0	0	0.0

Group 1 = treated with ivermectin 3 days before vaccination.

Group 2 = treated and vaccinated in the same day.

Group 3 = treated 3 days post vaccination.

Group 4 = vaccinated non-treated.

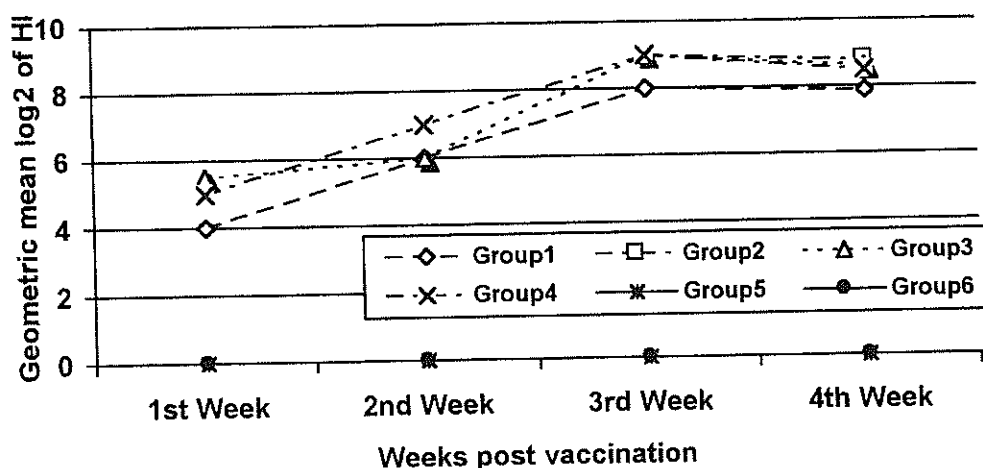
Group 5 = treated non-vaccinated.

Group 6 = non-treated non-vaccinated.

**Table (2) Results of challenge test on the experimental groups**

Groups	Number of animals	Dead animals	Protection%
Group 1	10	0	100%
Group 2	10	0	100%
Group 3	10	0	100%
Group 4	10	0	100%
Group 5	10	10	00%
Group 6	10	10	00%

**Fig.(1) Geometric mean of HI antibody titer against rabbit haemorrhagic disease vaccine**



### الملخص العربي

تأثير مستحضر "الإيفرمكتين" على الإستجابة المناعية للأرانب المحصنة  
بلقاح النزف الدموي الفيروسي للأرانب

نبيل عدلى عبد الونيس - محمد سيد مدكور - فكرية البردينى  
سلوى الأصيلى

لدراسة تأثير مستحضر الإيفرمكتين على الإستجابة المناعية للأرانب المحصنة بلقاح النزف الدموي الفيروسي تم تحصين مجموعات من الأرانب بلقاح النزف الدموي الفيروسي ومعاملتها بمستحضر الإيفرمكتين قبل وأثناء وبعد التحصين. وقد أظهرت نتائج إختبار منع التلزن الدموي وإختبار التحدى المناعى عدم وجود تأثير ملحوظ لمستحضر الإيفرمكتين إيجابا أو سلبا فى المناعة المكتسبة فى المجموعات المختلفة.