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المناعة الأمويه المنقوله من الأبقار المحصنة بلقاح حمى الوادي المتصدع الميت

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أجريت دراسة على الأبقار والجاموس وكذا عجولها بعد تحصين الأمهات بلقاح حمى الوادي المتصدع الميت باستخدام تجارب منع التلازن ، المكمل المثبت ، التعادل والترسيب في الأجار ٠

وبينما أعطيت تجربة الترسيب في الأجار نتيجة سلبية لم تظهر التجارب الأخرى أية فروقات جوهرية بين كلا النوعين (أبقار وجاموس) ٠

ولقد أمكن الحصول على علاقة بين تجارب منع التلازن ، المكمل المثبت والتعادل أمكن منه التوصية بأنه يجب تحصين العجول الصغيرة باللقاح عند سن ثلاثة أشهر ٠

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MATERNAL IMMUNE RESPONSE TRANSFERRED FROM BOVINES VACCINATED WITH INACTIVATED RIFT VALLEY FEVER (RVF) VACCINE

(With Two Tables)

By

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SUMMARY

Seroconversion in pregnant cattle and buffaloes as well as their calves following vaccination with inactivated RVF vaccine was estimated by the haemagglutination inhibition (HI), complement fixation (CF), serum neutralization (SN) and agar gel precipitation (AGP) tests.

The AGPT gave a negative result with both species, while the other tests did not show any significant difference between the two species.

A correlationship could be established between the HI, CF and SN tests, from which it is recommended to vaccinate calves of the two species at the age of 3 months.

INTRODUCTION

Immune response following vaccination with the locally prepared inactivated Rift Valley Fever (RVF) vaccine was studied in sheep (EL-NIMR, 1980 and TAHA, 1982), goats (ZAGHAWA, 1984) and cattle (TAHA, 1982). Since data concerning the immunity in newly born animals following natural infection or vaccination are still scanty with respect to Egyptian breeds, NAWAL (1984) studied the level and duration of maternal immunity in lambs triing to determine the age at which these newly born lambs become susceptible and has to be vaccinated.

Thus, the purpose of the present study is analogous which would has its reflection on national vaccination programmes. This would establish the time susceptible bovine calves has to be vaccinated thus minimizing the risk of infection.

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MATERIAL and METHODS

(A) Material:

1. Animals:

Nineteen pregnant bovines (9 cattle and 10 buffaloes) from Sakha and Mahalet Mousa farms, Kafr El-Sheikh Governorate were used in this study. The animals as well as their calves were ear tagged.

2. Vaccine:

A locally prepared inactivated RVF vaccine was used for the vaccination of animals (EL-NIMR, 1980 and TAHA, 1982).

(B) Methods:

1. Vaccination:

Two months before delivery, each animal was subcutaneously (s/c) inoculated with one ml. of the vaccine which proved to be safe and valid for use.

2. Sample collection:

At predetermined intervals as shown in table (1), blood samples and colostrum were collected from each mother separately. In addition, serum samples were obtained from each calf immediately after birth before receiving any meal and then at predetermined intervals. Sera and colostrum samples were kept at -20°C till used.

3. Serological techniques:

a- Serum neutralization test (SNT): According to WALKER, et al. (1970 a & b).

b- Complement fixation technique (CFT): As described by EDWIN (1969).

c- Haemagglutination inhibition test (HI): Following the technique of CLARKE and CASALS (1958).

d- Agar gel precipitation test (AGPT): According to the method described by MANSI (1958), and the recereuting method adopted by NAWAL (1984).

RESULTS

Results of the seroconversion of cattle and their calves are presented in table (1). Moreover, table (2) demonstrates the permissible figures for cattle and buffaloe calf sera.

DISCUSSION

In the present work, the HI, CF, AGP and SN tests were used to measure th hummoral immune response consequent to vaccination of pregnant cattle as well as the immunity transmitted to their respective calves.

Results of the HI revealed that the HI titre started to increase post vaccination of pregnant cattle till it reached the peak at labouring time. Moreover, the titer of the colostrum was higher then the serum (nearly double) which was previously found by NAWAL (1984). With respect to calves they started to show HI antibodies after ingesting the colostrum and a high serum titer was detected after 7 days, being reduced to a very low level after 3 months and hardly detectable by the fourth month. As for buffaloes, they nearly had the same pattern

as cattle. So, there is no appreciable differences between the passive immune response in the two species with respect to HI antibodies.

Concerning the CF test, prevaccination serum titer was 8 which may be from either previous vaccination or exposure to RVF virus. Then, the CF antibodies ran a course parallel to that of the HI antibodies, i.e., highest titer just before parturition. Colostrum from pregnant bovines could not reveal the presence of CF antibodies due to its anticomplementary effect. CF titer of calf sera after one week was equal to that of dam's serum, then declined reaching a very low level after 3 months. Although the same results were noticed by NAWAL (1984), yet there was no relationship between the CF titer of the same mother before parturition and its respective calf. Again this test could not show any detectable species variation.

AGP test gave negative results as those reported by NAWAL (1984) with sheep and lamb sera. Since this type of antibodies are better detected in infected sera (EL-NIMR, 1980 and AYOUB and ALLAM, 1981), so, the test could be a valuable tool for diagnosis of active viral infection.

SN antibodies in the prevaccination sera may be due to either previous vaccination or infection. The NI of the colostrum was double that of the serum which is similar to NAWAL (1984). It was also noticed that animals with a higher serum NI gave a higher colostral NI which was not previously found with CF and HI tests. The appearance as well as the decline of neutralizing antibodies in calf sera was nearly similar to that of HI and CF antibodies, i.e. reaching the level of 1.0 after 3 months.

A correlation between the three tests revealed that an HI titer of 14 equals a CF titer of 12 and a NI of 1.07 for bovine calves, being 24, 12 and 1.1 respectively for buffaloe calves. This means two important facts: first that the SN and HI tests are the most sensitive ones to measure antibodies against FVF virus. Although the SN test is the most accurate quantitative one in case of vaccinated animals (BROWN, et al. 1957; WALKER, et al. 1970 a; FAGBAMI, et al. 1973 and EL-NIMR, 1980), yet in emergency diagnosis one may run the HI test. Second, a NI of 1.0 is considered as protective (WALKER, et al. 1970 a), which was reached after 3 months in both calves and consequently bovine calves should be vaccinated at the age of 3 months. This is supported by the fact that immunoglobulins passively transferred from mothers to their offsprings (TIZZARD, 1982) showed this index (the protective level) at the age of three months.

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Table (1)
Average titres for the serological tests on sera from vaccinated cattle, buffaloes and their calves as well as the colostrum

Samples	Serological test					
	HI[1]		CF[1]		SN[2]	
	C	B	C	B	C	B
Mother:						
Prevaccination serum	62	38	8	8	0.9	0.9
Serum 21 days post-vaccination	293	184	18	21	1.8	1.7
Serum at labouring (60 days p.v)	675	736	26	42	2.1	2.3
Colostrum	1280	1216	AC	AC	3.9	4.0
Calf:						
Serum after birth	-	-	-	-	0.2	0.25
Serum at one week	782	736	30	32	2.3	2.3
Serum at one month	220	200	22	21	1.9	1.95
Serum at two months	52	86	18	16	1.6	1.55
Serum at three months	14	24	12.5	12	1.00	1.10
Serum at four months	-	20	4	6	0.7	0.7

HI = Haemagglutination inhibition test.
SN = Serum neutralization test.
1 = Geometric mean.
P.V. = Post-vaccination.
CF = Complement fixation test.
C = Cattle, B = Buffaloes.
2 = Average neutralizing index.
AC = Anti-complementary.

Table (2)

Permissible HI, CF titres and NI of cattle and buffaloe calf sera

Animal	Titres at the age of 3 months		
	HI[1]	CF[1]	NI[2]
Cattle calf	14.00	12.5	1.00
Buffaloe calf	24.00	12.0	1.10

1 = Geometric mean.
2 = Average neutralizing index.