Vet.Med.J.,Giza. Vol.42,No.1.(1994):129-133

EFFECT OF EMBRYO TRANSFER AND NATURAL SERVICE ON THE HUMORAL IMMUNE RESPONSE IN FINN AND RAHMANI SHEEP TO RIFT VALLEY FEVER (RVF) VACCINE.

By

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Received 1/12/1993

SUMMARY

In an experiment, the study of effect of Embryo Tranafer (E.T) and Natural Service (N.S) on the humoral immune response in Finn and Rahmani sheep vaccinated by inactivated RVF-vaccine was determined by Complement-Fixation test(CFT). Generaly, the level of humoral antibodies of RVF-vaccine was higher in pregnant Finn breed than the local Rahmani breed either in (E.T) or in (N.S), i.e. (E.T) was associated with a higher level of antibodies than (N.S) in two breeds. Also, Finn born lambs had a higher level of RVF maternal antibodies than Rahmani born lambs, whether, by (E.T) or by (N.S).

INTRODUCTION

Sheep as other ruminants, are borne agammaglobulinaemic due to the syndesmochorial placentation of the ewes (Tizard, 1982). Lambs get maternal antibodies through the colostrum which they suckle in their first hours of their life, these antibodies are vitally important for the protection of lambs against the potenial pathogens. It was essential to determine the level and the duration of maternal immunity transmitted to lambs from immunized ewes in order to determine the most suitable time for the initial vaccination of such lambs. Immune response following vaccination with the locally prepared inactivated RVFV-vaccine was studied in sheep (El-Nimr, et al., 1981 and Taha, 1982). Also, (Nawal, M. A. 1984) studied the level and the duration of maternal immunity in lambs (local breed). It is known that, sheep have a special position among RVF susceptible hosts due to their remarkably high susceptibility to infection specially newborn lambs. Hence immunization of lambe should be considered in any vaccination programme. The purpose of the present investigation is to compare in a preliminary study between (E.T) and its difference from (N.S) in Finn and local sheep breed (Rahmani), regarding the immunity conferred in sheep vaccinated by inactivated Rift Valley Fever (RVF) vaccine.

MATERIALS AND METHODS

MATERIALS:

1) Animals:

a) Ewes: 8 Finn and 15 Rahmani ewes (3-4 years old) were housed in a sheep farm at (Sakha, Kaffr El-Sheekh Governorate) which belongs to the Animal Production Research Institute. They were in a good healthy condition, concerning to feeding housing and mangement (as the same for two breeds). They hav been already vaccinated 6 months before (E.T) or (N. S) and boostering dose one month after that by RVF-vacine. (Table I)

b) Lambs: They were the offsprings that have been deliverd from Finn and Rahmani ewes, described in (Table I)

c) Finn Ram: Have a good health, and tested for fertilizing capacity i.e with a high pedigree used for fertilization of Finn and Rahmani ewes by natural service.

2) Finn Embryoes: were collected from Finn ewes

from (PELSO farm) in Finland, and shipped to Egypt as frozen embryoes.

3) RVFV-vaccine: A locally prepared inactivated RVFV-vaccine, was used for vaccination of animals (El-Nimr, et al 1981 and Taha, 1982).

4) RVFV-antigen: Sucrose-acetone extracted suckling mouse infected liver, was used in the (CFT), kindly supplied by NAMRU-3.

METHODS:

2) Embryo Transfer (E.T):- were applied to 6 Finn and 8 Rahmani ewes the number of transferred embryoes (aged 6.5 days) was 3-4) each ewe. The transfer of embryoses was applied according to (Hanafy, 1990).

2). Natural Servic (N.S): were applied to 2 Finn and 7 Rahmani ewes by mating wit' the Finn Ram.

3). Vaccination of pregnant ewes: Finn and Rahmani ewes were vaccinated 6 month before (E.T) & (N. S) and booster dose during the first half of pregnancy with a single dose of RVFV-vaccine .

4) Sampling Technique: Venous blood was taken from pregnant ewes weekly 1.5 month before parturition, as well as 2 days; then weekly till two months after delivery from the ewes and their respectivelly lambs. A separate sterile needle was used each time for each animal. The samples were refrigerated at 4C° overnight; the serum was then separated by centrifugation at 1500 r. p. m. for 10 mins.; decanted and stored at -20C° untill tested.

5). Serological Technique: The micro-complement-Fixation test (CFT) was used according to (Grist, et al; 1974).

RESULTS

Table (II): Show that the passive immune response which determined by complement-fixing antibodies was different in Finn. and Rahmani breed; it was higher in the first. Also, the CF antibodies were higher in ewes which implanted by embryoes than which naturally serviced in two breeds.

Table 1:Describe the ewes number and their respectivelly lambe

Ewe No.	Breed	Embryoes Transfer (E.T)	Natural Servise (N.S)	Lamb NO.
559	Finn	Applied	Not applied	97
803	"	"	" "	98 , 99
60	"	"	" "	100
499	"	"	" "	113 , 114
55	"	"	" "	Not concepted
57	"	"	" "	Not concepted
536	Finn	Not applied	Applied	107
406	"	" "	"	110 , 111 , 112
6271	Rahmani	Applied	Not applied	101
5710	"	"	" "	102
5937	"	"	" "	103
5515	"	"	" "	104
6006	"	"	" "	106
5056	"	"	" "	105
5274	"	"	" "	108
5548	"	"	" "	109
5814	Rahmani	Not applied	Applied	2420 , 2421
181	"	" "	"	2432
5602	"	" "	"	2422
5021	"	" "	"	2431
5230	"	" "	"	2423
5830	"	" "	"	Not concepted
5817	"	" "	"	Not concepted

Table (II): Result of the active immune response in vaccinated Finn & Rahmani ewes with inactivated RVFV vaccine by Complement -Fixation Test (CFT).

Breed No.	Finn. ewes (6)												Rahmani ewes (13)											
Method of application	Embryoes Transfer (E.T)						Natural Service (N. S)						Embryoes Transfer (E.T)						Natural Service (N. S)					
Number	4						2						8						5					
CI titre	1/32	1/16	1/8	1/4	1/2	-ve	M	1/32	1/16	1/8	1/4	1/2	-ve	M	1/32	1/16	1/8	1/4	1/2	-ve	M	1/32	1/16	1/8	1/4	1/2	-ve	M
4th month of preg																											
3rd week	4	0	0	0	0	0	32	1	1	0	0	0	0	24	8	0	0	0	0	0	32	3	2	0	0	0	0	25.6
4rd week	4	0	0	0	0	0	32	1	1	0	0	0	0	24	2	6	0	0	0	0	20	1	4	0	0	0	0	19.2
5th month of preg																											
1st week	4	0	0	0	0	0	32	0	2	0	0	0	0	16	1	7	0	0	0	0	18	0	3	2	0	0	0	12.8
2nd week	2	2	0	0	0	0	24	0	1	1	0	0	0	12	1	4	1	0	0	0	17	0	3	2	0	0	0	12.8
3rd week	2	2	0	0	0	0	24	0	1	1	0	0	0	12	0	2	6	0	0	0	10	0	1	4	0	0	0	9.6
4th week	0	4	0	0	0	0	16	0	11	1	0	0	0	12	0	2	6	0	0	0	10	0	1	4	0	0	0	9.6
Parturition	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
After parturition																											
2nd day	0	4	0	0	0	0	16	0	1	1	0	0	0	12	0	2	6	0	0	0	10	0	1	4	0	0	0	9.6
1rt week	0	4	0	0	0	0	16	0	1	1	0	0	0	12	0	2	6	0	0	0	10	0	1	4	0	0	0	9.6
2nd week	0	4	0	0	0	0	16	0	1	1	0	0	0	12	0	2	2	0	0	0	8	0	1	4	0	0	0	4.8
3rd week	0	2	0	0	0	0	12	0	1	1	1	0	0	6	0	2	2	1	0	0	7.5	0	1	4	0	0	0	4.8
4th week	0	2	0	0	0	0	12	0	1	1	1	0	0	6	0	2	3	2	1	0	5	0	1	4	0	0	0	2.8
5th week	0	2	0	0	0	0	12	0	1	1	1	0	0	6	0	2	3	3	2	0	4.3	0	1	3	0	0	0	1.6
6th week	0	2	0	1	1	0	8.5	0	1	1	1	0	0	6	0	2	3	3	2	0	4.3	0	1	3	1	1	2	1.2
7th week	0	2	0	1	1	0	8.5	0	1	1	2	1	0	4	0	2	3	4	2	1	3	0	1	1	1	1	4	0.5
8th week	0	0	0	1	2	1	4	0	0	0	1	1	0	3	0	0	0	2	3	3	1.8	0	0	0	1	1	4	0.5

ET : Embryone Transfer
N.S : Natural Service

preg. : pregnancy
O : Zero

Finn. : Finnlandi
M : Mean

Table (III): Result of the maternal antibodies in lambs sera delivered from Finn. & rahmani mothers by Complement Fixation Test (CFT).

Breed No.	Lambs of Finn. ewes										Lambs of Rahmani ewes									
Method of application	Embryoes Transfer (E. T)						Natural Service (N. S)				Embryoes Transfer (E. T)						Natural Service (N. S)			
Number	6						4				8						6			
CF titre	1/32	1/16	1/8	1/4	1/2	-ve	M	1/32	1/16	1/8	1/4	1/2	-ve	M	1/32	1/16	1/8	1/4	1/2	-ve	M
2 nd week	4	2	0	0	0	0	26.7	0	4	0	0	0	0	16	2	3	3	0	0	0	17	0	1	5	0	0	0	9.0
1st week	4	2	0	0	0	0	26.7	0	4	0	0	0	0	16	2	3	3	0	0	0	17	0	1	5	0	0	0	9.0
2nd week	2	3	1	0	0	0	20.0	0	2	2	0	0	0	12	1	3	4	0	0	0	14	0	1	2	3	0	0	7.0
3rd week	1	3	2	0	0	0	16.0	0	2	2	0	0	0	12	0	3	5	0	0	0	11	0	0	1	5	0	0	4.7
4th week	0	3	2	1	0	0	11.3	0	1	2	1	0	0	9	0	3	5	0	0	0	11	0	0	1	6	0	0	4.0
5th week	0	2	3	1	0	0	10.0	0	1	2	1	0	0	9	0	1	3	4	0	0	7	0	0	0	2	4	0	2.7
6th week	0	1	3	2	0	0	8.0	0	0	1	2	1	0	4.5	0	1	3	2	2	0	6.5	0	0	0	0	6	0	2.0
7th week	0	1	3	2	0	0	8.0	0	0	1	2	1	0	4.5	0	0	0	4	3	1	2.8	0	0	0	0	4	2	1.3
8th week	0	0	2	3	1	0	5.0	0	0	0	1	2	1	2.0	0	0	0	3	3	2	2.3	0	0	0	0	3	3	1.0

ET : Embryose Transfer
N.S : Natural Service
M : Mean
CF : Complement Fixation
0 : Zero

Table (III): Show that maternal antibodies in lambs sera varied according to the mother (Finn. or Rahmani), it was higher in the first. also, the maternal antibodies were higher in lambs deliverd from mother which implanted by embryoes than mothers naturally serviced, either these mothers were Finn. or Rahmani breed.

N. B. Finn. mothers No. 55, 57 not concepted, so not recorded in Table (II) Rahmani mothers No.5830, 5817 not concepted, and not recorded also.

DISCUSSION

From the results and statistic analysis, it was observed that, Embryoes Transfer (ET) or Natural Service (N.S) in inactivated RVF vaccinated pregnant Finn ewes was accompanid by a significant higher level of antibodies response as asayed by complement-fixation test (CFT), while the local breed (Rahmani) showed a lower level of antibodies. This result is acumulative of (E.T) and (N.S) Hence if considered each alone, it is remarkable that (N.T) or (N.S) precured higher level of complement-fixing antibodies as compared each with Rahmani breed. This result may be explained due to the generic difference in the immune response to the given antigen (Tizard, 82). The humoral immune response in Finn sheep is higher than Rahmani sheep; On the other hand, the difference revealed between the effect of (E.T) and (N.S) in both breeds is surprising , it is observed that, (E.T) is asociated with a significant level of antibodies to RVFV-vaccine than (N.S). The actual mechanism of such effect is not obvious, but it seems that the (E.T) technique adopted or the size of the implanted embryoes have their effect in induction of antibodies formation, on the contrary, the humoral action during the (N.S) may have as inhibiting effect in the immune response. These required further investigations. The results showed also that, the Finn born lambs have a significant higher level of specific maternal antibodies than the Rahmani local breed; whether, by (E.T) or (N. S). This can be attributed to the corresponding transferred of higher level of maternal antibodies from Finn ewes to their lambs via the colostrum; comparatively, a lower level of antibodies from Rahmani to their lambs. Finally, an intensive study is required for application of this experiment on a large scale of animals to realize the previous concepts.

ACKNOWLEDGEMENT

Thanks to Egyptian Finn sheep Breeding Project for making available the sheep flock and other facilities that enabled this work to be carried out. I wish to thank the staff members fo Sakha Animal Production Research Station and the staff members of Sheep & Goat Research Division,Animal production Research Institute for their help during this work especially Dr. O. Salama,; Dr. Ferial. H. and Dr. S. Nakhia.

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