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Knowledge, Attitude and Practices (KAPS) of Veterinarians and Farmers on Foot and Mouth Disease with Estimation of Risk Factors for Animal Infection in Egypt

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Abstract: This study was performed to characterize the Knowledge, Attitude and Practices of both the veterinarians and farmers on FMD in Egypt. In addition, to estimate some risk factors of the infection with FMD virus. Two structured questionnaires were built for he veterinarians and farmers. A total of 59 farmers and 18 veterinarians were interviewed. 97% of the farmers are ignorant by the constituents of foot and mouth disease vaccine and did not know the immunization status of the newly purchased animals.13.5% of the farmers thinks that the vaccine is ineffective and needs more concern from the authority. At least two risk factor for FMD spread are been practiced by all the farmers. Moreover, 71% of the farmers are located within the high risk group who practiced at least 4 risk factors for FMD spread. 39% of the veterinarians declared that there is errors in the vaccination process against FMD. In conclusion, some defects in FMD control program were reported which could be responsible for the inability to give the required protection. In addition, FMD education campaigns to the farmers are required to minimize or prevent the high risk practices responsible for the disease transmission and spread.

Key words: FMD · Knowledge · Attitude · Practices · Egypt

INTRODUCTION

Foot and Mouth disease (FMD) is an infectious economically devastating disease of clove footed animals [1, 2]. Picorna virus of the genus Aphthovirus [3] is the causative agent of foot and mouth disease and here are 7 serotypes of the virus; O, A, C, SAT1, SAT2, SAT3 and ASIA-1, which are immunologically distinct [4]. The Middle East and North Africa have several of these serotypes circulating currently or periodically [5].

FMD in animals is characterized by high morbidity, vesicles and ulcers on the oral and nasal mucosa, teats, coronary bands and inter digital spaces, anorexia, fever, reduced milk production and excessive salivation is often observed in cattle [6-9]. In addition, the disease is accompanied by heat intolerance syndrome and overgrowth of the hair in cattle [10]. The disease has great economic impact results from the severe loss in body weight of meat cattle and a significant reduction in milk yield in lactating animals[11] and morbidity is significant and can approach 100% [7]. Mortality is typically lower in adult animals (1- 5%), although higher mortality rates are typically observed in young animals usually from multifocal myocarditis [6-12].

FMD is endemic in Egypt and recently, several severe outbreaks were observed in spite of the national control program is being established long time ago. The national control program against FMD depends on vaccination of all ruminant species twice a year with locally prepared trivalent vaccine (O, A and SAT_2), together with animal movement control. Some farmers buy another polyvalent imported vaccine contain 6 strains. The current study was aimed to investigate the points of weakness in the current national control program which could be solved through measuring of KAPs of the veterinarians and farmers.

MATERIALS AND METHODS

Target Population: The target population was the farmers of dairy and beef sector at both household and dairy farms levels, as well as the veterinarians in Kafr El-Sheikh governorate. The target population was notified either at

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household or farm. Upon notification, the animal's owner and/or the person who is responsible for rearing of the animals and the veterinarians were interviewed to collect data regarding animal production and losses before and after the FMD outbreak, vaccination process by the national authorities in Egypt and their KAPs regarding FMD.

Questionnaires and Interviews: Two structured questionnaires were built; the first one was administered to the head of the household or the person who is responsible for rearing animals in the farm. The questionnaire includes questions on cattle ownership, management and knowledge of FMD. The second questionnaire was for veterinarians and had focused on their involvement and knowledge of the disease prevention and control activities, especially with regard to cattle diseases and FMD in particular. Copies of the questionnaire are available on request.

Epidemiological Measures

Prevalence Estimation: The prevalence of FMD at the study area in 2016 was estimated by dividing the number of farm/household which had FMD in 2016 over the total number of the examined farm/households, then multiply by 100.

Risk Score Estimation: The farmer's questionnaire examined the risk practices they carried out. Each risk factor carried out by the farmer was given a Figure 1. So if a farmer practiced 2 risk factors, then he got score of 2. In this questionnaire, there are 7 risk factors measured for each farmer; mixing different animal species in one place, mixing their own animals with that of other farmers, introduce animals through purchasing, common water source, common pasture, gathering different animals in vaccination campaigns and passing of Bedouin flocks by farmers place. The number of risk factors practiced by each farmer was calculated. Farmers were divided into 3 groups; first, the low risk group who do not practice all of these risk factors. Second moderate group, are those who practices 3 or less of these risk factors. Finally the third group is the high risk group who practices 4 or more of these risk factors.

Data Management and Analysis: Collected data were stored in Microsoft excel 2007. The statistical analyses were carried out on using Microsoft excel built in functions.

RESULTS

Farmers Questionnaires: A total of 59 farmers were interviewed and accept to answer the questions directed to them. For the knowledge, 10 farmers declared that they suffered from FMD in 2016. The prevalence of FMD among Farmers/households was estimated at 17%. On the other hand,53 (90%) of the farmers declared that they had suffered from FMD in the previous years. Most of the farmers (97%) are not aware of the constituents of the vaccine and are not aware if the animals which they bought are vaccinated or not against FMD. On the other hand, 30 farmers (51%) declared that the vaccine is an effective way for FMD control and 8 (13.5%) of them said that it is not effective or need more interest from the authority to improve its quality. Veterinarians are responsible to perform vaccination themselves for 44% of the farmers' animals, while >50% of the farmers said that the workers are responsible for that. About 30% of the farmers mix their animals with that owned by other farmers, the season of mixing and duration of mixing is shown in Table 1.

The answers of the farmers on the questions related to vaccine and vaccination process, animal mixing and purchasing and the morbidity and mortality rates of FMD are presented in Table1.

Results of the Risk Scores: All of the farmers practice at least 2 risk factors for FMD spread. 17 (29%) of the farmers are in group 2; moderate risk score and those who practices at 3 or less of the risk factors involved in FMD spread. On the other hand, the majority of farmers (71%) are located within the high risk group, who practice at least 4 of the 7 risk factors in the distributed questionnaire.

Veterinarians Questionnaires: A total of 18 veterinarians were interviewed and accepted to answer the questions directed to them. A total of 17 veterinarians are governmental veterinarians and one is a non-governmental veterinarian and has its private clinic. Most of the veterinarians are using the locally prepared vaccine for the protection of the animals against FMD and only 16% of them use both of the imported vaccine and the local vaccine. Problems in vaccination process were reported by 39% of the veterinarians and this includes either the transport of the vaccines under unfrozen conditions, in most of cases and the usage of an expired vaccine in a few cases. They all confirmed that emergency vaccination does occur upon an order from the authority

Table 1: Results of the questionnaires distributed to the farmers at Kafr El-Sheikh governorate for the measuring of their KAPs on FMD

Question	Number of farmers		Question	Number of farmers	
Animal species in the household	One species	21	Other animals mixed with yours	Yes	18
	Mixed species	38	at a part of the year?	No	41
Do you normally buy	Yes	2	From where do you buy your	Animal markets	41
vaccinated animals?	No	0	animals?	Farms	3
	Not specified	57		Other	15
Do the Bedouins herds	Yes	42	Only the veterinarian is responsible	Yes	26
pass by your village?	No	17	for vaccination?	No	33
Vaccinated in the routine vaccination	Yes	33	The way of preservation of vaccine by	In Ice tank	39
campaigns held by GOVS against FMD?	No	25	the person responsible for vaccination	In hand	2
	No answer	1		No answer	18
Do you ask to take vaccine to house?	Yes	23	Take animals to be vaccinated in	Yes	32
	No	13	communal vaccination campaigns	No	9
Common water source for drinking	Yes	44	Common pasture grazing with	Yes	2
	No	15	other animals?	No	7
Buy private vaccines against FMD before?	Yes	12	What the usual time do you	Any month	26
	No	48	vaccinate your animals?	Haphazardly	14
Times of vaccination per year	Once/year	10	Control measures applied to decrease	Treatment	43
against FMD?	Twice/year	13	disease incidence during outbreak?	Vaccination	13
	At campaigns	15		Isolation	1
How long do your animals mix with	< 3months	4	Time of the year of mixing other	Winter	3
other animals per year?	All the year	14	animals with yours?	Summer	15
How long the time elapsed between the	Days	5	What age of animals is more	1-6 month	12
purchasing of last animal and appearance	Weeks	4	severely affected in the previous	6-18 month	5
of FMD?	Months	1	out break?	18-36 month	10
				>36 months	8
What age of animals is more severely	1-6 month	4	What was the mortality rate in the	0-5%	30
affected this year?	6-18 month	1	previous years?	5-15%	1
	18-36 month	4		>50%	6
	>36 months	5		No Mortalities	15

Table 2: Results of the questionnaires distributed to the veterinarians at Kafr El-Sheikh governorate for the measuring of their KAPs on FMD

Question	Number of veterinarians		Question	Number of veterinarians	
Do you receive instruction of vaccine	Yes	14	Do you notice any error in vaccine	Yes	7
preservation?	No	4	transport and preservation?	No	11
Do you go to houses for animal vaccination?	Yes	2	Is the time allowed for vaccination is	Yes	10
	sometimes	14	enough of all available animals?	often	6
	No	2		no	2
Do you collect animals in one place for	Yes	16	Do you obtain incentives if you	Yes	6
vaccination?	No	2	performed vaccination?	No	12
What are those animals representing from	<10%	2	How often times of vaccination do	once	1
the total numbers of animals (percentage	10-50%	4	you perform per year?	twice	2
of vaccinated animals?	>50%	9		>2	14
How do you see FMD vaccination in Egypt?	Good	0	What about farmers' response to	Good	4
	need more interest	18	vaccination?	Moderate	10
				Bad	4
What is the optimal method do you see to	Vaccination	13	Is there emergency vaccination?	Yes	18
get rid of FMD problem?	eradication	5		No	0
Time of vaccination in the year	Specific time	18	Are there any sanitary measures at the	Yes	4
	No specific	0	end of vaccination day?	No	14
In your opinion what are the reasons of	The infection	3	Do you have sufficient number of	Yes	4
incompliance with vaccination campaign?	Lack of trust	5	workers to finish vaccination day?	Sometimes	2
	Both of them	10		No	12

or when there is local outbreak. Most of the veterinarians (66.6%) do not receive incentives for the vaccination process (Table 2) and 44.4% of them declared that this is dramatically effected on their performance. Results of questions on the logistics of vaccination campaigns are shown in Table 2.

DISCUSSION

Foot and Mouth disease is an endemic disease in Egypt. Unusual high economic losses due to the high mortalities, especially in young animals and the mass production loss in adults were recently detected in several outbreaks during the last few years [13, 14]. New serotypes and strains were isolated in these different outbreaks [15], this put in question the efficacy of the local prepared vaccine against such viruses. This study was designed to measure the KAPs of the farmers and veterinarians on FMD, especially on the vaccination process to find out the reasons for the appearance of such outbreaks because vaccination is very important to control the disease [16].

The results of the both questionnaires showed that all farmers and veterinarians are aware of FMD and can easily identify new cases and outbreaks depending on the disease epidemiology and signs. In spite of this fact and the appearance of outbreaks in winter seasons, all of farmers and veterinarians declared that the vaccination process has no specific timing.

This study showed that the vaccination coverage does not exceed 50% of the target population every year and this may explain that there are a huge percentage of animals are susceptible, especially with the unrestricted animals' movement across the country, the controlled movement of animals is practiced to control the disease worldwide [17]. This low coverage percentage could be attributed to the lack of collaboration of the farmers, as shown in the veterinarians answers, because of the lack of trust in the official vaccination campaigns, or fear of infection resulting from the collection of the animals in one place.

The lack of incentives to the veterinarians and the lack of sufficient logistics in vaccination process such as lack of sufficient workers may represent an impairment factor in the success of such process. This can lead to the ignorance of the veterinarian to follow the hygienic measures required, as shown in the veterinarians' questionnaire and not achieve the required target of vaccination. Ignorance of the veterinarians to the hygienic measures may be responsible for the incomplete collaboration of the farmers with the vaccination campaigns.

There are a considerable percentage of the veterinarians who confirmed the defects of the preservation of the vaccine in addition to the usage of the vaccine after its expiry date. This could be another reason for the failure of vaccination process in the country. More than half of the farmers mentioned that the vaccination process is carried out by the assistants and the workers other than veterinarians. This is a weak point as well in the vaccination process.

This study showed the wide knowledge of the farmers on some risks of the disease transmission and this is the reason for asking the veterinarians to carry the vaccination inside the animals' pens. In addition, they seek buying the private vaccines to be confident of its soundness. On the other hand, the farmers are still carrying out the risk behaviors which could be responsible for the spread and transmission of FMD. These risk behaviors include buying animals from the markets without knowing their vaccination status. Also, they mix their animals with other farmers' animals, mostly on communal pasture and water and this could be responsible for the wide circulation of O, A and SAT2 serotypes in Egypt [18].

The mortality rate as reported by the farmers is mostly does not exceed 5% and the severity of signs in the new outbreak in 2016 in adult animals is more than reported in previous years.

In conclusion, this study showed that, in spite of the huge national control program which depends mainly on the vaccination with spending huge amount of resources; there are some defects in such program which could responsible for inability to give the required protection. Also, there is a need for education campaigns to the farmers to minimize or prevent high risk practices responsible for the disease transmission and spread.

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