

List of contents

1. INTRODUCTION	1
2. LITERATURE	3
2.1. FOOT AND MOUTH DISEASE	3
2.2. FMD VIRUS	3
2.3. TYPING AND SUB TYPING OF FMD VIRUS	4
2.4. EPIDEMIOLOGY OF FOOT AND MOUTH DISEASE	5
2.4.1. Foot and mouth disease in Egypt	5
2.4.2. Prevalence of Foot and mouth disease in the world	7
2.5. TRANSMISSION OF FMD	9
2.6. PATHOGENESIS OF FMDV	11
2.7. FOOT AND MOUTH DISEASE IN SHEEP	13
2.8. PERSISTENCE OF FMD	15
2.9. ANTIGENIC COMPONENTS OF FMD VIRUS	18
2.9.1. Structural proteins	18
2.9.2. Non- structural proteins (NSP)	19
2.9.2.1. Virus Infection Associated Antigen (VIA)	19
2.10. INACTIVATION OF FMDV	21
2.11. IMMUNITY AGAINST FOOT AND MOUTH DISEASE	21
2.11.1. Active Immunity	21
2.11.1.1. Immunity after infection	21
2.11.1.2. Immunity after Vaccination	24
2.12. ISOLATION AND IDENTIFICATION OF THE VIRUS	27
2.13. SERUM NEUTRALIZATION TEST (SNT)	27
2.14. ENZYME LINKED IMMUNOSORBENT ASSAY (ELISA)	29
2.15. 3ABC-ENZYME LINKED IMMUNOSORBENT ASSAY (3ABC-ELISA)	33
2.16. POLYMERASE CHAIN REACTION	35
3. MATERIAL AND METHODS	40
3.1. MATERIALS	40
3.1.1. Animals	40
3.1.1.1. Sheep	40
3.1.1.2. Unweaned baby mice	40
3.1.2. Sheep Serum samples	40
3.1.3. Epithelial tissue samples	43
3.1.4. Oesophageal pharyngeal (op) fluids	43
3.1.5. Reference virus	43
3.1.6. Tissue cultures (established cell lines)	43

3.1.7. Chemical reagents	44
3.1.7.1. <i>Media</i>	44
3.1.7.1.1. <i>Growth medium</i>	44
3.1.7.1.2. <i>Maintenance medium</i>	44
3.1.7.2. <i>Bovine serum</i>	44
3.1.7.3. <i>Trypsin</i>	44
3.1.7.4. <i>Sodium bicarbonate solution</i>	44
3.1.7.5. <i>Neomycin</i>	44
3.1.7.6. <i>Nystatine (antifungal)</i>	45
3.1.7.7. <i>Tween 20</i>	45
3.1.7.8. <i>Crystal Violet Stain</i>	45
3.1.8. Reagents used in ELISA	45
3.1.8.1. <i>Coating Buffer</i>	45
3.1.8.2. <i>Phosphate Buffer Saline (PBS)and Bovine Albumin</i>	46
3.1.8.3. <i>Washing Buffer</i>	46
3.1.8.4. <i>Phosphate Citrate Buffer</i>	46
3.1.8.5. <i>Substrate</i>	47
3.1.8.6. <i>Stopping Solution</i>	47
3.1.8.7. <i>Conjugate</i>	47
3.1.8.8. <i>Tween 20</i>	47
3.1.8.9. <i>Blocking buffer</i>	47
3.1.9. Prio Check FMDV Non Structural protein	47
3.1.10. Nucleic acid recognition reagents and kits	48
3.1.10.1. <i>Total RNA purification kit</i>	48
3.1.10.2. <i>RNA extraction reagents</i>	49
3.1.10.3. <i>RT-PCR kit</i>	49
3.1.10.4. <i>PCR kit</i>	50
3.1.10.5. <i>Primers</i>	50
3.1.11. Materials used for detection of RT-PCR & PCR products	51
3.1.11.1. <i>Tris Acetate EDTA (TAE) gel electrophoresis buffer (40X)</i>	51
3.1.11.2. <i>Loading Buffer</i>	51
3.1.11.3. <i>Agarose</i>	51
3.1.11.4. <i>Ethidium bromide (Eth Br)</i>	51
3.1.11.5. <i>Nucleic acid markers</i>	52
3.1.12. Equipment and supplies	52
3.1.12.1. <i>Biological safety cabinet</i>	52
3.1.12.2. <i>Cooling centrifuge</i>	52
3.1.12.3. <i>Vortex mixer</i>	52
3.1.12.4. <i>Water bath</i>	52
3.1.12.5. <i>Single and multichannel pipettors (microtitre pipette)</i>	52
3.1.12.6. <i>Disposable syringe filters</i>	53
3.1.12.7. <i>Equipment for cell cultures</i>	53
3.1.12.8. <i>Inverted light microscope</i>	53
3.1.12.9. <i>Microtubes with attached cap (Microfuge tubes)</i>	53

3.1.12.10.	<i>Thermocycler</i>	53
3.1.12.11.	<i>Electrophoresis unit (set)</i>	54
3.1.12.12.	<i>Power supply</i>	54
3.1.12.13.	<i>Transilluminator, UV</i>	54
3.1.12.14.	<i>Gel Documentation and Analysis system</i>	54
3.1.12.15.	<i>Other equipment</i>	54
a.	<i>Refrigerators and Freezers</i>	54
b.	<i>Incubators</i>	54
3.2.	METHODS	55
3.2.1.	<i>Protocol of sheep vaccination</i>	55
3.2.2.	<i>Preparation of serum samples</i>	55
3.2.3.	<i>Oesophageal pharyngeal(op) fluids</i>	55
3.2.4.	<i>Preparation of FMD virus</i>	55
3.2.5.	<i>Baby mice</i>	56
3.2.6.	<i>Serological tests</i>	56
3.2.6.1.	<i>Enzyme linked ImmunoSorbent Assay (ELISA)</i>	56
3.2.6.1.1.	<i>Preparation of ELISA antigen</i>	56
3.2.6.1.2.	<i>Titration of the conjugate</i>	56
3.2.6.1.3.	<i>Testing of the serum samples using indirect ELISA</i>	57
a-	<i>Coating</i>	57
b-	<i>Blocking</i>	57
c-	<i>Serum dilutions</i>	57
d-	<i>Addition of the conjugate</i>	57
e-	<i>Addition of the substrate</i>	57
f-	<i>Addition of the stopping solutions</i>	57
g-	<i>Interpretation of the results</i>	57
3.2.6.2.	<i>Serum Neutralization Test (SNT)</i>	58
3.2.6.2.1.	<i>Staining the SNT microplates used in the test Procedures</i>	58
3.2.6.3.	<i>PrioCHECK FMDV NS test</i>	59
a-	<i>Day 1</i>	59
b-	<i>Day 2</i>	60
3.2.6.3.1.	<i>Interpretation of the Percentage Inhibition</i>	60
3.2.7.	<i>Molecular detection of FMDV by RT-PCR and PCR</i>	61
3.2.7.1.	<i>FMD-RNAextraction-(isolation)</i>	61
3.2.7.2.	<i>One-step reverse transcriptase-polymerase chain reaction (RT PCR)</i>	62
3.2.7.3.	<i>Polymerase chain reaction (PCR)</i>	62
3.2.7.4.	<i>Agarose Gel Electrophoresis of PCR Products</i>	62
4.	RESULTS	64
4.1.	<i>ISOLATION AND IDENTIFICATION OF FOOT AND MOUTH DISEASE VIRUS FROM FIELD SAMPLES</i>	64
4.2.	<i>REVERSE TRANSCRIPCATION CHAIN REACTION POLYMERASE (R.T PCR)</i>	66
5.	DISCUSSION	92
6.	SUMMARY	98

7. REFERENCES.....	100
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Abbreviations and Symbols

μL	Microliter
BHK21	Baby Hamster Kidney cells clone 21
CFT	Complement Fixation Test
CPE	Cytopathic Effect
D.D.W	Double Distilled Water
DPI	days post infection
ELISA	Enzyme Linked Immunosorbant Assay
FMD	Foot and Mouth Disease
FMDV	Foot and Mouth Disease Virus
I/P	Intra Peritoneal
MEM	Minimum Essential Media
MLD50	Mice lethal dose 50
nm	Nanometer.
NSPs	Non Structural proteins
OD	Optical density
OIE	Office International des Epizootie
OP	Oesophageol Pharyngeal fluid
OPD	OrthoPhyneyleneDiamine
PBS	Phosphate buffer saline
PD50	Protective Dose 50
RIP	Radio-Immuno Precipitation
RNA	Ribonucleic acid
rpm	Revolution per minute
RT- PCR	Reverse Transcriptase Polymerase Chain Reaction
SC	Sedimentation coefficient
SAT	South Africa Territories
SNT	Serum Neutralization Test
TCID50	Fifty tissue culture infective dose
μL	Microliter
UV	Ultra Violet
VIA	Virus Infection Associated Antigen
VNT	Virus Neutralization test
VP	Virus protein
VSVRI	Veterinary Serum and Vaccine Research Institute
WPI	Week post infection
WRL	World Reference Laboratory of foot and mouth disease

6. Summary

In this study 852 serum samples were collected randomly from apparently healthy sheep in Al-Giza, Al-Ismailia, Al-Behira and Al-Menya governorates. The serum were submitted for detection of antibodies against FMDV serotypes O1 & A using SNT and ELISA. Differentiation between vaccinated and previously infected sheep was done by PrioCHECK NSP blocking ELISA.

The results indicated that, antibodies against both serotypes of FMDV O1 & A were detected from the four governorates under investigation.

In Al-Menya governorate the percentage of O1 antibodies was 19.54% (34/174), while antibody percentage against A was 14.94 % (26/174).

At the same governorate, the previously infected sheep (according to serum collected sample) were about 18.4% (32/174), when PrioCheck blocking ELISA used.

In Al-Ismailia governorate the percentage against O1 was 18.4 (51/276) while for A, it was 24.6 (68/276), meanwhile sheep previously infected with FMDV were 17.4 % (48/276).

In Al-Giza governorate 34.58% (46/133) of samples were positive to O1 while 18.04 % (24/133) were positive to A, 29.32% of the collected serum samples showed previous infection with FMDV.

FMDV serotype O1 antibodies percentage was 10.78% (29/269) in Al-Behira, while it was 25.65% (69/269) for A. 18.2% (49/269) was due to previous infection with the virus.

Moreover, the effect of repeated vaccination on sheep with bivalent FMD vaccine locally produced was studied. The study showed that the non-structural protein antibodies of FMDV started to appear since the 4th vaccination. The PrioCHECK FMDV NSP blocking ELISA was used in this study.

On the other hand, virological investigation was done on samples collected from Al-Ismailia and Al-Behira governorates where FMD outbreaks were existed. The samples were tongue epithelium (E.T) and oesophageal pharyngeal fluid (OP), Al-Ismailia (3 E.T and 7 OP) and Al-Behira (2 E.T and 11 OP).

The samples were inoculated in tissue culture BHK21 clone 13 cell line and in unweaned baby mice. Cytopathic effect (CPE) and classical clinical signs and deaths were observed. ELISA indicated that 2 E.T samples were of serotype O1 and 1 E.T of serotype A while 5 of OP samples were FMDV serotype O1 and 2 of serotype A in Ismlia governorate.

In Al-Behira governorate 2 E.T samples of serotype O1 while 7 OP samples were of serotype O1 and 4 OP samples were of serotype A. The virological obtained results were confirmed by RT-PCR. E.T & OP isolated FMDV serotype O1 were used for extraction of FMDV RNA and subsequent amplification of 3D coding sequences, primers used in one step.

RT-PCR achieved success when the target FMDV 3D sequences (422 bp) were amplified. All the tested samples showed positive with variable visible intensity on ethidium bromide stained gel.

⇒ **Our results concluded that:**

- ✓ FMD is still widely spread in Egypt, with higher rate in Upper Egypt than that of Lower Egypt.
- ✓ Egyptian sheep are playing an important role in epidemiology of FMD and issue of sheep vaccination is very important.
- ✓ FMD PrioCHECK test is useful in detection of previously infected animals and reliability of the test in differentiation between infected and vaccinated animals.
- ✓ The results of PCR assay documented the accuracy and efficacy of the test rather than that of traditional one (SNT and ELISA) .