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Serological Survey of Caprine Toxoplasmosis at Mogadishu Somalia

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Abstract: *The study was conducted at veterinary laboratory at Somali National University (SNU) Mogadishu Somalia for period from June 2018 to February 2019. A cross sectional survey was taken in 6 districts in Benadir region, Somalia vizDharkenley, Huriwa, Wadajir, Warta-Nabada, Bondere and finally Hodan districts.300 local breed of untreated goats was selected from the six districts under the study regarding to sex, level of production, age groups.The sampling procedure was non-probability purposively sampling. Blood sample were directly collected from jugular vein by venipuncture.The results stated according to their reproduction status were classified three main groups: 175 were lactating (64.9%) of them were positive and their serial dilution was in between 1:5 till to 1:160 and they were more active.Concerning the prevalence in different age group, 34 sample were testing group one (≤1* ***age 1)*** *and (73.5%) of them were positive,and this made by dilution and it was in between 1:80 (1) and lowest was 1:5 (16).*

Keywords: *Serological survey, Caprine, Toxoplasmosis*

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I. Introduction

*Toxoplasma gondii*is an intracellular protozoan organism that has a large numbers of intermediate hosts, including all warm-blooded animals, and humans, Felids, particularly the domestic cats, are definitive hosts and the only animal species in which oocystdevelop (Dubey J.PA., 1986,DubeyJ.P., 2004) the parasite of toxoplasmosis infection can affect wide range livestock and in man including goats (Dubey, *et al*. 2011).In small ruminants, regarding to this diseases results source of abortion, still births and neonatal deaths, however, sub-clinical infection may also occur in adult animals (Buxton, 1990,Hassig et al., 2003). Congenital transmission occurs when female animals get infection during pregnancy and acute infection may cross placenta and multiply in fetal tissue resulting in abnormal development and abortion. The open-air meat markets are considered as a potential source of infestation of human by T. gondii. While being transported from slaughter houses, the meat is by far contaminated with oocysts of T. gondii hence resulting as a risk factor of zoonosis to human beings. The incidence of T. gondiiseroprevalence in different species of animals including goats has been studied in many countries of the world with results varying from country to country, region to region, herd to herd and season to season. (Yu et al., 2007). In Somalia, there is little study on toxoplasma gondiiin domestic animals, including cattle, sheep, goats, and chickens. There is intermediate host that transmit the disease including rats, cats and dogs which are therisk factors of the disease that causes abortion and sterility to goats subsequentlytransmitted to human being.Keeping in view with aforementioned facts, the study focuses on serological survey of caprine toxoplasmosis in Mogadishu.

II. Methods And Materials

Study area and period

The study was conducted at veterinary laboratory at Somali National University (SNU) Mogadishu Somalia for period from June 2018 to February 2019. A cross sectional survey was taken in 6 districts in Benadir region, Somalia *viz*Dharkenley, Huriwa, Wadajir, Warta-Nabada, Bondere and finally Hodan districts.

Study Population

The population of this study waslocal breed of untreated goats which were selected purposively from six districts in Mogadishu.

Procedure of the research

300 local breed of untreated goats was selected from the six districts under the study regarding to sex, level of production, age groups. The sampling procedure was non-probability purposively sampling. Blood sample were directly collected from jugular vein by venipuncture method there is no previous history about Toxoplasma gondii by using sera separated from blood into screw caped/ plug serum tubes like Eppendorf tube and Polypropylene sterile cryo-vial tube, transferred to refrigerator, serum were subjected to TOXO LATEX KITA rapid latex agglutination test for qualitative and semi-quantitative detection of Toxoplasma gondii antibodies in serum manufactured by ATLAS MEDICAL in United kingdom (UK), Examine macroscopically the presence or absence of visible agglutination immediately after removing the slide from the rotator. The presence of agglutination indicates an antibody concentration equal or more than 4 IU/mL, the titer, in the Semi-quantitative method, is defined as the highest dilution showing a positive result.

Research material

Instrument and equipment: Recording book, papers, pens and marker pens, Computer, Cotton,Gloves,Lap coat, Syrings, Peaker and needles, Microscope, Centrifuge, Serological Pipette 50-100ul 0 to 100-1000ul and their Tips, Rag, Forceps, and Stop watch, Vacuum container and test tubes,Eppendorf tube and Polypropylene sterile cryovial tube, Zop plaster, Slide, Stirring sticks, Refrigerator at -20 °C, Test slide, Stirring Sticks and Package inserts.

Chemical and reagents Toxo latex reagent (Latex particlescoated with soluble T.gondii antigen, pH, 7.5 sodium azide 0.95 g/dL), Toxo positive control, Toxo negative control, Alcohol 70% and 100% and Normal saline solution (NS) 0.9% NaCL.

Atlas Toxo Latex Kit Testing Procedure

Qualitative Test: Samples and reagents were brought at room temperature, then was used a serological pipette applies 40uL of undiluted serum samples and two drops of control to slide. It was shaken the vial well, transferred 1 drop (20µL) of toxo latex to the samples, mixed well with stirring sticks, and rotated slowly the slide.After4-6 minutes, itwas checked for agglutination, at the same time compared with the reaction of the control.

Semi-Quantitative Test: The positive data from qualitative methodwas applied for serial two fold dilutions of the sample in 9 g/L saline solution by looking agglutination with the use of magnification.

III. Methods

Blood sample and serum separation: Blood samples of 300 goats untreated goats was aseptically collected from jugular vein-puncture of by using (2-5ml) sterile syringesthat is labeled to the identification number of each goat recording about sex, aged groups and lactating periodswhich they came to. And then into the Vacuum container left one hours at room temperature in order to clot well, After the work ended the blood samples are transported into the laboratory of Somali national university (SNU) and centrifuged at 1500r.m.p for 5minutes to obtain the serum, and then sera was into cryovials and eppendrof tube that glued zop plaster in order to write identification number. Then the sera are stored in the refrigerator at temperature below -20 °C

LIMITATIONS OF THE PROCEDURESOURCES OF ERROR

Heavily lipaemic sera and plasma must be excluded, since they can cause non-specific reactions.

Calculations: The approximate anti-Toxoplasma concentration in the patient sample is calculated as follows:4xanti-Toxo Titer= IU/mL

Reference values: Up to 10 IU/mL**.**Each lab should establish its own reference range.

PERFORMANCE CHARACTERISTICS

Analytical sensitivity: 10 IU/mL, under the described assay conditions

Prozoneeffect: Up to 200IU/mL. Occasionally aprozone effect may be observed with strong positive sera. Therefore in these cases where a suspected case of toxoplasmosis gives a negative result, it should be repeated using 1/5 serum dilution in Nacl 9 g/L.

Diagnostic sensitivity: 96.1%

Diagnostic specificity: 89.6%

Data analysis: Collected data was managed and organized then analyzed through the Statistical Package for Social Sciences (SPSS version22),

IV. Results And Discussion

4.1. Prevalence of caprine toxoplasmosis regarding to the sex

A total of 300 goats were tested to detect antibody against *Toxoplasma gondii* by using Toxo-Latex agglutination test, the overall prevalence was 58.0% according male and females, the highest positive was found in male (61.5%). Respectively the lowest sero-posative was female which was(57.8%). The repeated of the

positive samples to the two fold serial dilution in male the highest serial dilution was in 1:40 (1) and the lowest was 1:5 (6). In female according to the repeated positive samples in two folded serial dilution the highest was 1:160 (2) and the lowest was 1:5 (157). According to the ***P-value*** there is no significance difference (P=0.137) between the sexes.

Table 1: Prevalence of caprine toxoplasmosis regarding to the sex

Sex	**No. Tested**	**Prevalence**	**P-*value***	**Two folded Serial dilution (%)**					
		Po+ cases (%)		**1:5**	**1:10**	**1:20**	**1:40**	**1:80**	**1: 160**
Male	13	8 (61.5%)	**0.137**	6	3 (50.0%)	2 (33.3%)	1 (16.7%)	0 (0.0%)	0 (0.0%)
Female	287	166 (57.8%)		157	72 (45.9%)	60 (38.2%)	19 (12.1%)	4 (2.5%)	2 (1.2%)
Total	**300**	**174 (58.0%)**		**163**	**75(46.0%)**	**62(38.)**	**20 (12.3%)**	**4 (2.5%)**	**2 (1.2)**

4.3 Prevalence of caprine toxoplasmosis according to level of production

The results stated according to their reproduction status were classified three main groups: 175 were lactating (64.9%) of them were positive and their serial dilution was in between 1:5 till to 1:160 and they more active. On the second group was a pregnant (55.4%) of them were positive, about their serial dilution made according to two fold serial the highest serial dilution was 1:80 and the lowest serial dilution was 1:5. In the Others was tested 118 the prevalence was 68 (57.6%) of them positive. According in two folded serial dilution for positive cases the highest serial dilution observed was 1:80 and the lowest was 1:5. According to ***P-value*** (0.126) there is no any significant between in the level of production.

Table3: Prevalence of caprine toxoplasmosis regarding to the level of production

Period	**No. Tested**	**Prevalence (%)**	***P*-value**	**Two folded Serial dilution (%)**					
				1:5	**1:10**	**1:20**	**1:40**	**1:80**	**1:160**
Lactating	94	(64.9%)	**0.126**	56	22 (39.3%)	21 (37.5%)	9 (16.0%)	2 (3.6%)	2 (3.6%)
Pregnancy	75	(49.4%)		35	21 (60.0%)	11 (31.4%)	2 (5.7%)	1 (2.9%)	0 (0.0%)
None	118	(57.6)		66	29 (44.0%)	28 (42.4%)	8 (12.1%)	1 (1.5%)	0 (0.0%)
Total	287	166 (58%)		157	72	60	19	4	2

4.4 Prevalence of caprine toxoplasmosis regarding to the according to age

Concerning the prevalence in different age group, 34 sample were testing group one (≤1 **age 1)** and (73.5%) of them were positive,and this made by dilution and it was in between 1:80 (1) and lowest was 1:5 (16). **Age group 2** (1-3) 158 was tested (55.7%) were positive. **Age 3** >3years 108 was tested (56.5%) were positive, Also the two folded serial dilution of this age group highest serial dilution 1:160 (2) and lowest dilution made was 1:5 (65) .**Age 3** >3years 108 was tested (56.5%) were positive, According the two folded serial dilution highest dilution was 1:80 (1) and lowest dilution in was 1:5 (82). ***P-value*** (0.000) showed there is high significant between in the different age groups

Table 4: Prevalence of caprine toxoplasmosis regarding to the according to level of age

Gender	**No. Tested**	**Prevalence (%)**	***P*-value**	**Two folded Serial dilution (%)**					
				1:5	**1:10**	**1:20**	**1:40**	**1:80**	**1:160**
Age 1 (≤ 1yrs)	34	(55.9%)	0.000	16	6 (37.5%)	6 (37.5%)	3 (18.7%)	1 (6.3%)	0 (0.0%)
Age 2 (1-3yrs)	158	(44.3%)		65	30 (58.5%)	17 (26.1%)	6 (9.2%)	2 (3.1%)	2 (3.1%)
Age 3 (>3yrs)	108	(78.7%)		82	39 (37.8%)	31 (36.1)	11 (13.4%)	1 (1.2%)	0 (0.0%)
Total	300	174(58.0%)		163	75	62	20	4	2

V. Conclusion

The study was conducted in veterinary laboratory at Somali National University (SNU) Mogadishu Somalia to assess the seroprevalence of *Toxoplasma gondii*in Mogadishu.The study concluded thatmales of goats were higher prevalence of *Toxoplasma gondii* than females. Further, the lactating goats were higher prevalence of *Toxoplasma gondii* than non-lactating and pregnant. Finally the prevalence also was higher in age group of (≤1 age 1).

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