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Serological study of Crimean – Congo haemorrhagic fever in Sheep in Thi – Qar province.

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Abstract

Crimean – Congo hemorrhagic fever virus (CCHFV) causes a lethal tick – borne zoonotic disease with severe clinical manifestation in humans but does not produce symptomatic disease in wild or domestic animals. It is endemic in a large region of the word. One of the main indicators that the disease is endemic in a region is the presence of antibodies specific to CCHFV in animal populations. The factors contributing to differential outcomes of infection between species are not understood. Serological studies have shown sheep are important to the survival of CCHFV in nature. Nevertheless, need for more studies on this subject in Iraq.

Blood samples were taken from 200 sheep of different sex, variable age and physiological status. Only 100 samples used for physiological testes while 186 used for Microbiological test (ELISA) test. The present study was appeared a high level about (144)78.53% of positive carrier sheep while negative samples (42)21.46% in Thi – Qar province which include different regions such as Al-eakihah , Al- rifai and Al- garma region which recorded about 92.85% , 90% and 90 % respectively comparative with another region of thi qar province that appear low level of infected such as Al-fadhliya , Al-tar and Al-manar which recorded about 75%, 50% and 60.71% respectively.

The current study focused on and attempted to connect the different physiological states , sex and age with infected animals. The male sex appears ahigh level of infected about 83.92% comparative with female was appeared low level of infected by CCHF virus about 74.61%, while recorded high infected in non – pregnant about 75% comparative with pregnant about 73,80 . Also, the present study was showed ahigh level of infected in age from 5 to nine years about 82.4% comparative with another age ranges which appeared about 71.11, 78.50 % .

Key words: serological, CCHFV, Diagnosis, Thi-Qar

Introduction

Crimean-Congo hemorrhagic fever virus is an enveloped, segmented, and negative sense single stranded RNA virus in the Orthonairovirus genus in the Nairoviridae family within the orderBunyavirales (Lombe et al.2021 ; Sana et al.2022).

The genus also includes Dugbe fever virus and Nairobi sheep disease virus , both of which are associated with human diseases (Honig et al. 2004 ; Lindeborg et al. 2012 ; Spengler et al. 2016) . Nairobi sheep disease virus is an orthonairovirus of veterinary importance causing a severe hemorrhagc and abortive disease in sheep and goats (Walker et al. 2016).

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Crimean congo hemorrhagic fever (CCHF) is an important tick borne zoonotic disease with a wide geographic distribution that affects people infect virus in contact with infected animals and ticks(Shayan et al., 2015). This disease is endemic in Africa, asia, the middle east, and southern Europe (Al-Abri et al., 2017 ; Flusin et al., 2010; Fillatre et al 2019 ; Messina et al. 2015).

CCHF is highly contagious and has fatality rate ranging between 10% and 50% (Flusin et al., 2010), some researches recorded fatal rate (3-80%) with acute and severe hemorrhagic manifestations, but the initial symptoms are generally nonspecific (fever, fatigue, myalgia, headache, diarrhea, etc.) followed by progressive haemorrhage, shock and multiorgan failure in severe cases(Ergonul, 2006 ; Mazzola and Kelly, 2019; Shepherd et al., 1989).

Fatal outcome is correlated to the increased viral load and dissemination, intravascular coagulopathy, and multi-organ failure (Zivcec, 2016). CCHFV specific vaccines and approved therapies are still unavailable, and supportive care remains the main stay of treatment (Messina et al., 2015) .

I. Materials and Methods

Two hundred sheep from different regions of Thi – Qar province were chosen for this study. The animals were collected from regions with hemorrhagic infection. Throughout the study period, which start from 10/ 2023 to 2/ 2024. The animals were clinically healthy, aged between less than one to nine years. The study was chosen sheep in different sex (male and female) and physiological status (pregnant and non – pregnant). Blood samples were drawn from the jugular vein at using two types of tube non- heparinized tube for immunology and. The serum was separated by centrifugation (3000rpm for 15 minute) and stored at -20 C until analysis. ELISA Linked (biotich).

Results

Table 1: Table (4-1): Distribution of all studied sheep (positive and negative) according to region:

Sample / Region	tal		ve		gative		P.Value
	N	%	N	%	N	%	
Suq ash shuyukh							0.000
Al-Fadhliyya							0.000
AL-Tar							1.000
AL-Batha							0.000
AL-Manar							0.032
AL-Shatrah							0.000
AL-Eakikah							0.000
Livestock al-nasiriyah							0.000
AL-Garma							0.000
AL-Rifai							0.000
Total							
P.Value							
**(p≤0.01).							

Table 1 in the present study was appeared a high level about (144)78.53% of positive carrier sheep while negative samples (42)21.46% in Thi – Qar province which include different regions such as Al-eakihah , Al- rifai and Al- garma region which recorded about 92.85% , 90% and 90 % respectively comparative with another region of thi qar province that appear low level of infected such as Al-fadhliya , Al-tar and Al- manar which recorded about 75%, 50% and 60.71% respectively table1.

Table (4-2): Distribution of all studied sheep (positive and negative) according to sex

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Sample / Sex	Total		Positive		Negative		P.Value
	N	%	N	%	N	%	
Female	130	69.89	97	74.61	33	25.38	0.000
Male	56	30.10	47	83.92	9	16.07	0.000
Total	186	100	144	79.26	42	20.72	0.000
P. Value	0.0001*8		0.0007**		0.0041**		
**(p≤0.01).							

Table 2: The male sex appears ahigh level of infected about 83.92% comparative with female was appeared low level of infected by CCHF virus about 74.61%.

Table 4-3: Distribution of all studied samples according to pregnant and non-pregnant ewe:

Sample / Female	Total		Positive		Negative		P.Value
	N	%	N	%	N	%	
Pregnant	42	32.30	31	73.80	11	26.19	0.000
Non pregnant	88	67.69	66	75	22	25	0.000
Total	130	100	97	74.4	33	25.59	
P.Value	0.0001**		0.0091**		0.068 NS		
**(p≤0.01).							

Table 3 in the current study was showed high significant differences in positive non pregnant ewe comparative with positive pregnant ewe at (P≤0.01).

Table 4-4: Distribution of all studied samples according to age.

Sample / age	Total		Positive		Negative		P.Value
	N	%	N	%	N	%	
Less than 1years							
1-5 years							
5-9 years							
Total							
P.Value	0.0001**		0.0001**		0.0097**		
**(p≤0.01).							

The statical analysis in table 4 showed ahigh level of infected in age from 5 to nine years about 82.35% comparative with another age ranges which appeared about 71.11, 78.50 %

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Discussions

Crimean- Congo hemorhagic fever virus causes a tick-bore viral disease with a geographical distribution in certain endemic areas such as eastern and southern Europe, Asia, the Middle – East, and Africa (Spengler et al., 2015).it possesses a high mortality rate (up to 40%), and there is no licensed vaccine available to combat the disease (Mertens., et al., 2013). Furthermore, virus behavior and replication characteristics are difficult to study due to the requirement of high containment laboratories. The virus has a high potential for emergence and introduction in new areas and remains a high health risk worldwide (Elliott, 2014; Zivcec et al., 2015)

The present study was appeared a high level about (144)78.53% of positive carrier sheep while negative samples (42)21.46% in Thi – Qar province which include different regions such as Al-eakihah , Al- rifai and Al- garma region which recorded about 92.85% , 90% and 90 % respectively comparative with another region of thi qar province that appear low level of infected such as Al-fadhliya , Al-tar and Al- manar which recorded about 75%, 50% and 60.71% respectively table1. Furthermore in recent related study conducted in mousl, the CCHF seroprevalence rate of was recorded 14% using indirect IgG ELISA and comprised 19.16% of sheep and 6.25% of goats (Altaliby et al., 2021). this results disagreement with (Dakhil,2024) was recorded 52.9% and 19% in sheep of The- Qar and Basrah province respectively while, in goat was recorded 20.8% and 10.3% in Thi-qar and Basrah province respectively. Albayrak et al., (2012) reported that anti-CCHF rate in sheep and goats were 85% and 66% respectively

The current study focused on and attempted to connect the physiological states, sex and age with infected animals. The male sex appears ahigh level of infected about 83.92% comparative with female was appeared low level of infected by CCHF virus about 74.61% table 2, the high level of infected in male may be due to small number of males in this study or reasons related to the virus receptors in males. This result agreement with other research (Dakhil,2024) which recorded ahigh level of infected female 48.4% and 20.9% comparative with male which recorded about 21.9% and 8.8% in thi- qar and basrah province respectively.

The current study was showed significant differences at between positive non pregnant ewe about 75% and positive pregnant ewe about 73.80 at ($P \leq 0.01$) while the present study was appeared no significant differences between negative specimens in pregnant and non -pregnant about 26.19 and 25 respectively at ($P \leq 0.01$) in table 3

Also, the present study was showed ahigh level of infected in age from 5 to nine years about 82.35% comparative with another age ranges which appeared about 71.11, 78.50 and 77.32%. the high level of infected in this age may be because of increase of animal number at this age stages table 4. The result of this study showed disagreement with (Dakhil, 2024) which recorded 62.2% and 37.8% in thi-qar and basrah province respectively at age 4-5 years while, recorded31.3% and 44.5% in thi qar and basrah province respectively at age 3months to 1 years in sheep.

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