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Detection of bovine viral diarrhea-mucosal disease (BVD-MD) virus in Dromedary camel in Iraq using ELISA/ A preliminary study

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Abstract

Bovine Viral Diarrhea- Mucosal Disease (BVD- MD) virus causes a high economic losses. BVD-MD infects a wide range of domestic animals (cattle, buffaloes, sheep and goat). The causative agent, bovine viral diarrhea virus (BVDV) is a member of the Pestivirus genus of the family Flaviviridae that composed of two genotypes (BVDV-1, BVDV-2) and each genotype has 2 biotypes: non-cytopathic (NCP) and cytopathic (CP). Only NCP strains of BVDV produce Persistently Infected (PI) animals. Eighty- eight blood samples were collected from dromedary camels in different areas surrounding Baghdad (Al-Shula, Abu- grab and Al-Fudhailiyih), as well as from Karbala, Najaf and Babylon governorates. All serum samples were examined using a BVDV specific indirect enzyme –linked –immunosorbent assay (ELISA) specific to BVD-MD virus antibody. Totally, 12 out of 88 (13.63%) serum samples revealed positive reaction for (BVD-MD) virus antibodies. Moreover, 5 / 22 (5.68%), 2 /22(2.27%), 4/22 (4.54%) and 1/22 (1.13%) revealed positive reaction from Baghdad, Karbala, Najaf and Babylon respectively. No significant differences were seen between male and female. In conclusion, this preliminary study approved presences of positive camels for BVD-MD virus. The author recommends to do another future study that included large numbers of camels and from different areas in Iraq, as well as observe the congenital anomalies and abortion in newly borne camels.

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Introduction

Bovine viral diarrhea virus (BVDV) is a member of the genus Pestivirus in family Flaviviridae (Franki *et al.*, 1991; Pringle, 1999). Each of the two genotypes has two biotypes, non-cytopathic (NCP) and cytopathic (CP) (Peterhans *et al*., 2010). The (NCP) genotype is series than (CP) genotype. (Amstel and Kennedy, 2010). The BVDV, border disease virus (BDV) of sheep and classical swine fever virus (CSFV) are antigenically

related,(Nettleton *et al.,* 1998). Bovine viral diarrhea (BVD) is a worldwide distribution infectious disease of cattle (Nettleton, 1995).

BVDV infections involve mainly respiratory, enteric and reproductive organs accompanied with increased risk of retained placenta and clinical mastitis, (Niskanin *et al.,* 1995). BVDV caused intrauterine death, stillbirth, and weak calf syndrome with congenital deformities, neonatal respiratory disorders and acute hemorrhagic gastroenteritis in adult dromedaries. Acute infection induced immunosupression that potentiate secondary bacterial and viral disease of the respiratory and enteric tract of persistently infected (PI) animals. The (PI) animal remain lifelong shedding large quantities of virus in secretion and excretions (carriers) (Alenius *et al.,* 1996). BVDV is a significant economic disease of ruminant, which is endemic in the majority of countries throughout the world. Review of literature, revealed scarce information regarding BVD in camel in Iraq. So this a preliminary study was designed to detect the infected camels with BVDV-MD in Iraq serologically

Material and methods

Eighty eight Blood samples were collected from dromedary camels from slaughter houses around Baghdad city (Abu-grab, Al-Shula, Al-Fudaiylia) as well as Karbala, Najaf and Babylon governorates. Blood samples were collected in tubes without anticoagulant and kept in cold box and transfer to the laboratory for further processing. Serum samples were separated from each samples and stored at (-20 ^{0}C) until used.

Serological test

Elisa Kits (antibody ELISA kits) were purchased from Belgium BIO-X diagnostics. The ELISA procedures were done according the instructions of the manufacture.

Results and discussion

ELISA antibody test were done for (88) serum samples. Totally, 12 (13.63%). out of 88 samples revealed positive results for BVDV antibodies (Table. 1).

Moreover, 5 / 22 (5.68%), 2 /22(2.27%), 4/22 (4.54%) and 1/22 (1.13%) revealed positive reaction from Baghdad, Karbala, Najaf and Babylon respectively (Table.1). Meanwhile, Baghdad governorate revealed the high number of positive camels and 5 out of the 22 samples revealed positive reaction. The positive samples were 1/7, 3/8 and 1/7 from Al-Shula, Abu-grab and Al- Fudhailiyih respectively (Table. 2). According to the sex, the samples were collected from 30 and 58 male and female respectively. Moreover, there were 4 (13.3%) and 8 (13.7%) positive samples from male and female respectively (Table.3). Statistical analysis revealed non-significant difference between male and female.

Table.1: Shows the number and percentage of positive samples in different governorate

Name of governorate	No. Sample	Positive	Percentage of infection
Baghdad	22	5	5.68%
Karbala	22	2	2.27%
Najaf	22	4	4.54%
Babylon	22	1	1.13.%
Total	88	12	13.63 %

Table.2: Shows the number and percentage of positive samples in different area surrounding Baghdad governorate

No. of examined samples	Name of area	No. of animals	Positive	Percentage
22	Al-Shula	7	1	4.54%
	Abu-grab	8	3	13,63%
	Al-Fudhailiyih	7	1	4,54%
Total		22	5	22.72 %

Table .3: Shows the number of positive samples in male and female with percentage

No. of examined animals	Sex	No.	Positive	Percentage
88	Male	30	4	13.3%
	Female	58	8	13.7%

BVD virus was detected in cattle in Iraq (Al Rodhan 2005). It was also approved in buffaloes ((Al-Rubayie and Hasso, 2012) using ELISA antigen and antibody. The results revealed presence of antibody against BVDV. This result is in agreement with (Doyle and Heuschele, 1983). The percentage of infection in Baghdad was (22.72 %). This result is compatible previous studies in Dromedary (18%) in Saudi Arabia (Al-Afaleq *et al*. 2006).

However, the results of this study is disagreed with Taha, (2007) in UAE dromedary that approved the sero-prevalence (negative) (Taha, 2007). The results of the current study revealed high percentage of positive animals in compare with previous studies. This might occurred due to mixed breeding management between animals in Baghdad especially the animals that act as a source of BVDV infection in camelids. The author believe that the infection occurred via the oronasal mucos, which occurs most probably after inhalation of viral particles which are present in body fluids of infected animals (Byers *et al*., 2011). In conclusion this study approved that the antibody of (BVD–MD)

virus was detected by specific (BVDV) antibody ELISA kits in dromedary camel. This result indicates the presence of the disease in Iraq in dromedary. The author recommends to do another future study that included large numbers of camels from different areas in Iraq. Polymerase chain reaction (PCR) is recommended with Antigen-enzyme-linked immunosorbent assay, and also skin biopsy with immunehistochemistry, (IHC) – antigen detection. Virus isolation and typing, sequencing are necessary also, in addition to observe the congenital anomalies and abortion in newly borne camels.

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