Detection of bovine viral diarrhea-mucosal (BVD –MD) virus using Elisa in Iraqi sheep

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Abstract

The ain of the study detection of BVDV for the (270) sera samples were collected from Iraqi sheep examined by ELISA kits to detect (BVDV) antibody, the results showed 58 positive samples with (21.48%) of total samples. The positive in ratios in ram (21,25%), while in females (ewes) were positive from total 190 females were examined, in a rate of (21.57%)

The result above indicated the presence of (BVD-MD) virus in sheep which considered as a causative agent specific to bovine appeared to be transmitted to sheep from infected bovine (PI) and causing a disease in (ovine). There is no significant difference between male and female.

Keyword: Bovine Viral Diarrhea, Border Disease, mucosal disease, Elisa, IRAQ, Sheep.

The aim of the study: was to evaluate the status of bovine viral diarrhea virus (BVDV) infection sheep in Iraq using Enzyme linked Immonosorbent Assay for the detection of specific antibodies of (BVDV).

Introduction

Bovine viral diarrhea virus (BVDV) is an RNA virus consist of two types, bovine viral diarrhea virus type 1 (BVDV1) and bovine viral diarrhea type 2 (BVDV2), Each type composed of two genotype cytopathic (cp) and non cytopathic (ncp)؛ the serious one is the (ncp) genotype. (BVDV), border disease virus (BDV), and classical swine fever virus (CSFV) huge cholera (HCV) belong to the genus *Pestivirus* within the family *Flaviviridae*. (1)

(BVDV), (BDV), (CSFV), (HCV) these viruses are typically isolated from primary host species, but are capable of infecting other species. **(2)**

The 4 recognized Pestivirus species, BVDV type I, BVDV type II, BDV, and CSFV are genomically and antigenically very similar to each other (3). Bovine viral diarrhea-Mucosal disease (BVD-MD) is a viral disease, it primarily affects cows, also can affect other ruminants like (sheep, goats, buffaloes, camels and wild ruminants). (4)(5) **The** transmission method in cattle has been primarily by ingestion or inhalation of the virus. The virus can be found in all body fluids (respiratory and oral secretions, urine, milk, semen and feces). Also can be transmitted from cow to fetus via transplacental . (6)

BVDV is a significant pathogen caused huge economic lose, associated with gastrointestinal, respiratory and reproductive disease (intrauterine infection); causing multiple clinical forms of infection that vary from mild subclinical to fatal mucosal disease. **(7)**

Pregnant female infected with (ncp) non cytopathic biotype at early stage of gestation lead to birth of persistently infected (PI) kids, fatal infection with (BVDV) may lead to immunotolerand kids to BVDV with an

inapparent persistent infection (PI) which are serving as source of infection by shedding large quantity of virus lifelong with various body excretion, PI animals are difficult to identify because of their normal appearance(8). PI females of reproduction age are source of horizontal transmission of BVD and resulting in PI calves **(9)**. If such animals are infect by the second biotype (cytopathic virus (cp) of similar virus they may catch mucosal disease (MD) which may lead to death,this disease is caused by combination of cytopathic(cp) and noncytopthic (ncp) biotypes of virus. BVDV usually causes early embryonic death, respiratory disease, diarrhea, congenital malformation, reproductive failures, lameness, immunosuprussion and (MD) mucosal disease. (10),(11)

Animals affected often have (bloody) diarrhea, mucosal lesions in the mouth and ulcerations of the muzzle, nose, rim of the hoof and in the interdigital cleft. The disease is fatal; animals are not generally expected to live longer than two to three weeks, although there are always exceptions. (12)

Bovine viral diarrhea (BVD) is one of the most important diseases of cattle responsible for major economic losses due to its immunosuppressine but it does not affect human (10)

ELISA test use to detect viral RNA antibody, it becomes apopular screening methoud for detection of BVDV(13)

Materials and methods

A total of 270 sera samples collected from jugular vein of local Iraqi sheep randomly from area around Baghdad city (al-shulla, Abu-grab and Al-Fudaiylia). the sera samples were stored at 20C̊ until used.

ELISA kits: antibody IELISA kits purchased from Belgium BIO-X diagnostics.

Method: ELISA procedure for antibody diagnosis of BVDV were performed according to instruction of the manufacturing company.

Results and discussion

ELISA antibody test was carried on totally (270) sera samples from sheep (58) samples were positive with (21, 48%) (Table1).

All sera samples were randomly collected from 90 sheep from each field area around Baghdad (Al-Shula, Abu-grab, and Al-Fudalia) the positive sera samples were (16) with (5, 92%), (14) with (5, 18%) and (28) with (10, 37%) in each field receptively (Table1).

Markedly significant regional differences between (Abu-grab and Al-Fudhaliyah) region in positive serological percentage from (5, 18%-10, 37%) receptively this may be due to mixed animal management in felid between different species so the transmit from (PI) infected calves to the sheep in same felid this will agree with (BAZ.T.I in Egypt),who confirmed presence of antibodies to BVDV in sheep (14), and frolick, et.al

whom mentioned that (BVDV) can transmit between species (15)

The results of this study demonstrate that BVDV can be transmitted under natural conditions from PI cattle to sheep.

Table (2) showed that (80) males (rams) of total animals of the study were tested , and (17) of the were positive by Elisa antibody test in rate of (12.25%)of total males ,while 41 females were positive with Elisa antibody test in rate of (21,57%) from total (190) females were examined and there were no significant difference between male and females

Table (1) Bovine viral diarrhea antibody detection by Elisa according to area around Baghdad in sheep

Area	No. of samples	Positive	Percentage
Al-Shula	90	16 C	5.92%
Abu- ghraib	90	14 C	5.18%
Al-Fudalyia	90	28 B	10.37%
Total	270	58 A	21,48 %

Different letters in columns men significant difference P<0,05

Table (2) Bovine viral diarrhea antibody detection by Elisa according to the sex in area around Baghdad in sheep

Sex	No	Positive	Percentage
Male	80	17	21,25%
Female	190	41	21,57%

In Iraq (BVDV) in cow was isolated by Alrodhan, N. (16). In buffaloes (BVDV) was prove in Iraq using Elisa by (Al-Rubayie,Khawlah,M.I and Saleem A. Hasso(2014)(17). Also proved in buffaloes by using PCR by (Al-Rubayie Khawlah. M.I (2009) (18).

Conclusion

According to the recent results (BVD) virus can spread between domestic ruminants bovine and ovine, the virus can transmit to sheep from (PI) infected animals which are the main sours of infection of (BVDV)

Recommendation

Polymerase chain reaction (PCR) is recommended test together with Antigen - enzyme-linked immunosorbent assay to diagnose (BVDV), in addition may be Skin biopsy with immunohistochemis, (IHC) – antigen detection. It is very necessary to spread between species in breeding, to prevent the transmission of the disease.

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التحري عن وجود مرض الاسهال الفيروسي البقري باستخدام اختبار المقايسة المرتبطة بالانزيم المناعي (الاليزا) في الاغنام العراقية

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الملخص

اجريت هذه الدراسة لتقيم مرض الاسهال البقري الفيروسي في الاغنام العراقية باستخدام تقنية الاليزا للكشف عن الاجسام المناعية المضادة.

جمعت (٢٧٠) عينة مصل من الضأن المحلية تم فحصها بعدة الاليزا (ELISA) لتحديد الاجسام المضادة الى مرض الاسهال البقري الفيروسي (BVDV). أظهرت النتائج ان ٥٨ عينة مصل كانت موجبة بنسبة (٢١.٤٨%) في مجموع عينات الاغنام الكلي.

من مجموع (٨٠) عينة مصل كانت من الذكور (الكباش) اظهرت ١٧ كبشا نتيجة ايجابية بفحص الاليزا (ELISA) وبنسبة ٢١.٢٥% من المجموع الكلي للكباش. بينما اظهرت (٤١) عينة مصل من الإناث (النعاج). نتيجة ايجابية لفحص اضداد (BVDV) باختبار الاليزا من المجموع الكلي للنعاج (١٩٠) وبنسبة (٢١.٢٧%).

تشير النتائج لوجود فيروس (BVD-MD) في الاغنام وهو الفيروس المسبب لمرض الاسهال البقري (BVDV) الخاص بالأبقار، عليه فان الفيروس يمكن ان ينتقل من الاغنام الى الابقار مباشرة وبوجود الابقار المصابة (PI) والتي يمكن ان تسبب المرض في الاغنام .

لم يكن هنالك فرق معنوي في نسبة الاصابة بين الذكور والاناث.