



SEROPREVALENCE OF ENZOOTIC ABORTION AND BORDER DISEASE IN SMALL RUMINANTS IN AL-BASRA PROVINCE, IRAQ

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Abstract

There is need to establish effective tools to control abortion in Iraqi sheep and goats; therefore, this study aims to detect the prevalence of enzootic abortion (*Chlamydophila abortus*) and border disease (*Pestivirus*) in sheep and goats using specific an indirect enzyme-linked immunosorbent assay (ELISA) kits. An overall 180 animals (100 ewes and 80 does) were selected randomly from different areas in Al-Basra province /Iraq, during December 2018 to January 2020, and subjected to venous blood collection and to documentation the history data of reproductive disorders. Totally, the results were revealed on 29.44% and 21.11% seropositive animals to *C. abortus* and border disease virus respectively. Significant increases in seropositive does (33.75% and 28.75%) in comparison to ewes (26% and 15%) were reported in both, *C. abortus* and border disease virus, infections respectively. Concerning to ODs as well as to IRPC and %IN of both diseases respectively, there are insignificant differences were detected between seropositive ewes and does. Regarding to reproductive disorders, no significant variation between seropositive and seronegative study ewes and does in both infections was reported. Abortion, dystocia and stillbirth for *C. abortus*, and abortion and dystocia for border diseases were the most significant reproductive disorders found among seropositive ewes. Abortions, dystocia, metritis, and stillbirth are the most significant reproductive disorders found among seropositive does for *C. abortus* but not for border disease virus. In conclusion, enzootic abortion and border disease are common infection among Iraqi flocks of sheep and goats, and further investigation using molecular diagnostic assays is needed.

Keywords: Sheep, Goats, Abortion, Iraq, *Chlamydophila abortus*, *Border disease virus*.

Introduction

Several infectious agents have been implicated in the etiology of ovine and caprine abortion which is an important cause of loss to the Iraqi sheep and goats industry. Enzootic abortion (EA) a bacterial disease caused by *Chlamydophila abortus* as well as the border disease (BD) caused by a *Pestivirus*, are two of the commonest causes of abortion in Iraq which both are reported in sheep, but only enzootic abortion detected in goats (Al-Rubayie and Hasso, 2014; Fahad and Salman, 2017). *Chlamydophila abortus* is a highly contagious pathogen which infected small ruminants particularly sheep resulting in a great economic losses due to annual abortions that rated 1-5% in diseased immune flocks and can be reach to 30% in recently infected flocks (Milne *et al.*, 2009). The infection sometimes causes placentitis with necrotic changes in the cotyledons and accumulation of reddish brown exudates in intercotyledonary areas; however, most infections in sheep and goats are asymptomatic apart from late term abortion or stillbirth (Hadley *et al.*, 1992; Buxton *et al.*, 2002). EA is usually transmitted through inhalation of infected barn dust or ingestion of contaminated food and water, and although infected animals develop immunity after abortion, they might remain carriers of the organism in their reproductive tract for up to 3 years (Rodolakis and Mohamad, 2010; Rodolakis, 2014). Also, rams/bucks may also acquire *C. abortus* from infected ewes/does and may spread the disease to other ewes at the time of breeding (Papp and Shewen, 1996; Aitken and Longbottom, 2007).

Border disease virus is a helical, enveloped, and non-cytopathic RNA virus which has been reported mostly as a sporadic cases across many parts of the world, and rarely as outbreaks in association with persistent infection with bovine viral diarrhoea virus (Kaiser *et al.*, 2016; Feknous *et al.*,

2018). The virus transmission occurs through contact with secretions and excretions of body fluids and tissues from infected animals, and spread rapidly through a flock (Kessell *et al.*, 2011). Persistently infected sheep and goats, usually asymptomatic seronegatives, are the major active reservoir which shed large quantities of virus in the urine, feces, and saliva (Pugh and Baird, 2012). However, if a pregnant ewe or doe is infected, the virus may be transmitted vertically to the embryo or fetus, and outcomes ranging from embryonic re-absorption to normal birth depending on the stage of gestation (Nettleton *et al.*, 1998; Pugh and Baird, 2012).

The basis for positive diagnosis of infection with *C. abortus* or border disease virus depends on a history of abortion in sheep and goats, evidence of placentitis, demonstration of organism or its antigens in affected placenta for *Chlamydophila*, or from abomasums, pancreas, kidney, thyroid, and testicular tissues of aborted fetus for border disease virus (Quinn *et al.*, 2011; Cebra and Cebra, 2012). Serological tests such as fluorescent antibody test (FAT), complement fixation test (CFT), agar gel immunodiffusion (AGID) test, and enzyme-linked immunosorbent assay (ELISA) are useful to detect exposure in unvaccinated animals. The demonstration of specific *C. abortus* or border disease virus is specific evidence of infection particularly in tested samples that show a significant rise in antibody titers (Hovers *et al.*, 2014; OIE, 2018; O'Neill *et al.*, 2018).

In Basrah province / Iraq, there are no available data associated with EA and BD in sheep and goats. Therefore, the current study aims to detect the prevalence of *C. abortus* and border disease virus in ewes and does, serologically, using an indirect ELISA, and estimate the relation of antibody titers to the history of reproductive disorders.