Research Article

Preliminary Study of Seroprevalence of *Chlamydophila Abortus* Amongst Cattle in Ninavah Province

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Abstract | Seroprevalence of ***Chlamydophila abortus*** in cattle in Ninavah Province, Nothern Iraq was determined by ID Screen™ *Ch. abortus* indirect enzyme linked immunosorbent assay (ELISA) on serum samples from 368 cows aborted cows (n=150), pregnant cows (n=150), and calves aged 1 month old (n=68). Seropositive cows were found only in 3 of 368 sera examined (0.82%). The present study is the first serodiagnosis of epizootic bovine abortion in randomly selected cattle herds in Ninavah province, Iraq.

Keywords | Bovine, *Chlamydiophila abortus*, Abortion, ELISA, Prevalence

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INTRODUCTION

Epizootic bovine abortion (Chlamydophila abortion) caused by *Chlamydophila abortus* (Former name) *Chlamydia abortus* (Andrews 2004; Da Silva et al., 2006; Reinhold et al., 2011). Chlamydophila abortion has been a major economic loss for domesticated ruminants worldwide (Andrews 2004, Banda et al., 2011, Godin et al., 2008). Depending on the previous studies , the main causes of bovine abortion in cattle in Ninavah province including brucellosis (Al-Farwachi et al., 2009), leptospirosis (Ajaj and Al– Farwachi, 2013) neosporosis and toxoplasmosis (Al- Badrani et al., 2012). Chlamydophila abortion is frequently asymptomatic but can lead to abortion , placentitis , stillbirth and subclinical mastitis (Banda et al., 2011; Kemmerling et al., 2009). Pneumonia and weight loss was recorded in calves (Julia et al., 2007, Reinhold et al., 2008, Wilson and Thomson, 1968). Serodiagnosis of chlamydophilosis is more frequently used because isolation of *Chlamydophila spp* is difficult and time consuming (He et al., 2007). Most seroprevalence data of bovine chlamydophilosis have been obtained using indirect haemagglutination assay, complement fixation test (CFT) and ELISA (He et al., 2007, He et al., 2007, Juma et al., 2013,OIE,2011). Prevalence of anti *C. abortus* antibodies in cattle was 0.7% in Mexico (Praga-Ayala et al., 2004), 45% in Austria (Biesenkamp-Uhe et al., 2007), 0.4% in Sweden (Godin et al., 2008), 26.4% in Poland (Niemczuk, 2005),4.44% in Ireland (Livingstone and Longbottom, 2012), 1.69% in Belgium (Yin et al., 2014), 51.3% in Taiwan (Wang et al., 2001), 7.25% in China (Zhou et al., 2013), 4.65% in India (Didugu et al., 2016), 26.92% in Turkey (Halil et al., 2007) and 48.4% in (Tehran) Iran (Esmaeili et al., 2016). The aim of the present study was to estimate the seroprevalence of epizootic bovine abortion in randomly selected cattle herds in Ninavah province

MATERIALS AND METHODS

Samples

The study was performed from September 2012 to September 2013 on 368 sera belong to 4 farms of local breed cattle (out door and in door management) where abortion had occurred around Ninavah province in northern of Iraq. Mosul is capital of the Ninevah Province, some 400 km (250 mi) northwest of Baghdad (Figure 1).

The sera were randomly collected from animals as 150 from aborted cows (mostly within 2-4 weeks post abortion), 150 from pregnant cows (at late stage of pregnancy)

,and 68 samples from calves aged one month old. All sera stored at -20 ^{0}C until serological examination.

Serological Examination

Serological examination were performed using indirect ELISA ID screen™ *Chamydiophila abortus* kit (ID- Vet innovative Diagnostics, montpeilier, France). All sera analyzed according to the manufacturers' instructions, The percentage of optical density (OD) was calculated as

%OD= Sample OD \ Oppc X 100

Oppc = Mean of positive control .

Sera were considered to be positive when OD ≥ 60.

Statistical Analysis

Statistical analysis of *Chlamydia* prevalence in cattle of different ages were performed by chi-squared test. Its performed by using the software of SPSS (Statistical Analysis System, Version 11.5, Chicago, Illinois). The differences were considered statistically significant if $P < 0.05$.

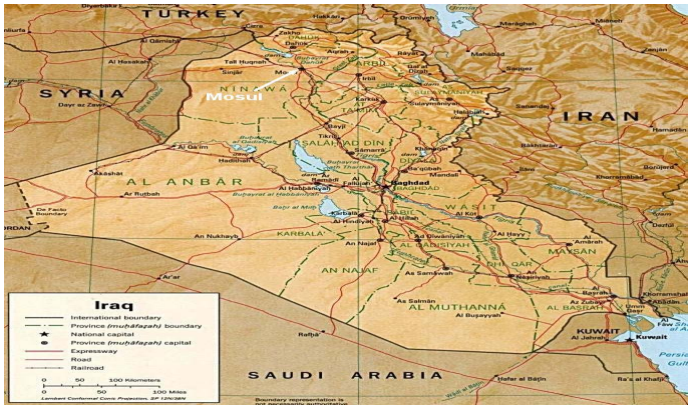

Figure 1: Map of Iraq

RESULTS

A results of preliminary serological study conducted on 368 sera were randomly collected from 4 herds around Ninavah province showed the seroprevalence rate among cows was 0.82%. A 0.66% of both aborted and pregnant cows were found positive to *C. abortus*. Of the 68 calves (one month age) examined, antibodies to *C. abortus* was found only one animal to be seropositive 1.47%. The *Chlamydophila* seroprevalence was statistically significant among cattle and calves ($P < 0.05$) (Table 1).

Table 1: Seroprevalance of *C. abortus* amongst cattle in Ninavah province.

Prevalences (%)	Positive number	Examined number	Animals
0.66	1	150	Aborted cows
0.66	1	150	Pregnant cows
1.47*	1	68	Calves
0.82	3	368	Total

*significant difference $P < 0.05$

DISCUSSION

Abortion has been serious economic problem for ruminants worldwide (Andrews 2004,Da Silva et al., 2006). Our study ,the chlamydophilial seroprevalence (0.82% amonge cattle in Ninavah, Iraq) was much lower than other counties, this result represent the first insight into the presence of *C. abortus* infection of cattle in Ninavah province, Iraq.

Several studies have reported substantial variation in seroprevalence of *C. abortus* antibodies in cattle worldwide as 45% in Austria (Biesenkamp-Uhe et al., 2007), 26.4% in Poland (Niemczuk, 2005),4.44% in Ireland (Wilson et al., 2012), 1.69% in Belgium (Yin et al., 2014), 51.3% in Taiwan (Wang et al., 2001), 7.25% in China (Zhou et al., 2013), 4.65% in India (Didugu et al., 2016), 26.92% in Turkey (Halil et al., 2007) and 48.4% in (Tehran) Iran (Esmaeili et al., 2016).

The variations in the results between our study and other studies may be due to many factors such as the geographical location of the study; type of the serological test used and its efficacy; size and type of sample taken; breed of animal; grazing strategies, bad management; nutritional deficiency, and uncontrolled restriction of diseased animal movement from infected area. In addition to virulence of chlamydial strains and possibly innate immunity amongst animal.

The result of this study showed of 0.66% of both aborted and pregnant cows were found positive to anti *C.abortus* antibodies by indirect ELISA. *C. abortus* is abortifacient pathogen in cattle (Banda et al., 2011, Johannes et al., 2014, Kemmerling et al., 2009). It cause epzootic bovine abortion in cattle (Andrews 2004, Da Silva et al., 2006, Reinhold et al., 2011).There are many infectious agents causes bovine abortion (bacterial, viral ,protozoal , and fungal agents) (Anderson, 2007; Andrews 2004, He et al., 2007, Öztürk et al., 2012).This might explain a much higher rate of seronegative in the aborted cows in the current study. Serological testing is more frequently used in routine diagnosis of chlamydophilosis because of absence of clinical signs in infected animal chlamydiophilosis until abortion occurs and pathogen isolation is difficult and time consuming (Juma et al., 2013, Qiu et al., 2006, Vlahović et al., 2001). The World Organisation for Animal Health (OIE) recommends the use of CFT and ELISA for detecting chlamydophilial antibodies (OIE, 2011). The ELISA kits are developed for serodiagnosis of *C. abortus* antibodies in ruminants such as ID screen™ *Chamydiophila abortus* kit ,Indirect ELISA, this test are more sensitive and specific as compared to CFT. (OIE, 2011, Vlahović et al., 2001).

Present study demonstrated that percentage of seropositive calves was 1.47% and the *Chlamydophila* seroprevalence

was statistically significant among cattle and calves These infection in calves originating from their dam with subclinical chamydophilia mastitis (Andrews 2004 Banda et al., 2011, Johannes et al., 2014, Reinhold et al., 2011) or through inutero transfer (Andrews 2004, Johannes et al., 2014, Reinhold et al., 2011). Newborn calves, which are highly susceptible to infectious agents because of the obstruction of uterine transfer of maternal antibodies by the syndesmochorial bovine placenta, represent an ideal population for the analysis of chlamydial infection. Thus, bovine neonates are immunologically naı¨ve, so that most calves, particularly if they do not receive colostrum, are prone to contract diseases (Anderson, 2007; Jee et al., 2004).

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

AUTHORS CONTRIBUTION

All authors contributed equally to this paper.

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