

Investigation of brucellosis in cattle and sheep in Urmia - Iran

Saman Seyyed GHOLIZADEH¹ Mohamad Hosein Sadeghi ZALI²
Amin HASHEMPOUR¹ Ehsan Mir AHMADI¹

¹ Islamic Azad University, Young Researchers Club, Urmia branch, Urmia, Iran

² Islamic Azad University, Member of scientific Veterinary Faculty of Urmia branch, Urmia, Iran

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SUMMARY

Nowadays the common disease between the human and animals have created so many problems in most of countries, especially in Iran. This research is done randomly on the base of the milk of the Cattle and Sheep's of the sides of Urmia City. In this study, 1117 and 598 milk samples collected from cattle and sheep in 100 different farms respectively, were tested with Milk ring Test (MRT) for brucellosis. Ten (1.55%), six (2.42%) and two (0.64%) milk samples from cattle collected in Spring, Summer and Autumn, respectively, were positive for brucella antibodies. However, 99 (16.55%) milk samples collected in Spring from sheep were found to be positive for brucella antibodies. Overall the results from this study showed that the seroprevalance of brucellosis in cattle and sheep in Urmia City, in Iran were 1.64 % and 16.55%, respectively.

Key Words

Brucellosis, Cattle, Sheep

Urmiye-İran'da Sığır ve Koyunlarda Brusellozisin Araştırılması

ÖZET

Günümüzde insan ve hayvanlar arasındaki ortak hastalıklar birçok ülkede, özellikle İran'da büyük sorun oluşturmaktadır. Bu araştırma, Urmiye kenti civarındaki sığır ve koyunlardan tesadüfi olarak alınan sütler ile yapıldı. Çalışmada 100 farklı çiftlikteki, 1117 sığır ve 598 koyundan alınan süt örneği, bruselloz için Süt Halka Testi ile test edildi. Bahar, yaz ve sonbaharda sığırlardan alınan süt örneklerinin sırası ile 10 (%1.55), 6 (%2.42) ve 2 (%0.64)'si bruselloz için pozitif bulundu. Ancak koyunlardan bahar aylarında alınan süt örneklerinin 99 (%16.55)'unda brucella antikorları tespit edildi. Bu çalışmada alınan sonuçların tümü, İran'ın Urmiye şehrindeki sığır ve koyunlarda bruselloz seroprevalansının sırasıyla %1.64 ve %16.55 olduğunu gösterdi.

Anahtar Kelimeler

Brusellozis, Sığır, Koyun

INTRODUCTION

Brucellosis is a very important zoonotic disease and distribute in worldwide (Apan et al. 2007; Fatma and Mahdey 2010). The disease caused by bacteria of the genus *Brucella*. The disease occurred by *Brucella abortus* in cattle, *Brucella melitensis* or *Brucella ovis* in Small ruminants, *Brucella suis* in pigs and *Brucella canis* in dogs (El-Hag El-Tahir and Nair 2011). It is transmitted by sexually mature animals with predilection of placenta, fetal fluid and tests of male animals (Kaoud et al; 2010). Brucellosis is characterized by abortion, with excretion of the organisms in uterine discharge and in milk (Hamidullah et al. 2009). Transmission of this infection to humans is occurred mostly by eating the infected tissues or dairy products.

Brucellosis is an infectious disease of domestic and wild animals with serious zoonotic implication in humans. The disease is an important public health problem in many parts of the world. Cattle, goats, pigs, sheep, horses and dogs play an important role in the transmission of brucellosis to man. In female animals, the bacteria are localized in the udder followed by excretion via milk and in male animals orchitis and epididymitis can lead to infertility (Akbarmehr and Ghiyamirad 2011).

Brucellae can enter mammalian hosts through skin

abrasions or cuts, the conjunctiva, the respiratory tract, and the gastrointestinal tract. In the gastrointestinal tract, the organisms are phagocytosed by lymphoepithelial cells of gut associated lymphoid tissue, from which they gain access to the sub mucosa. Organisms are rapidly ingested by polymorphonuclear leukocytes, which generally fail to kill them, and are also phagocytosed by macrophages. Bacteria transported in macrophages, which travel to lymphoid tissue draining the infection site, may eventually localize in lymph nodes, liver, spleen, mammary glands, joints, kidneys, and bone marrow (Bret et al. 2007).

The Rose Bengal Plate Test and Milk Ring Test (MRT) are accepted as an efficient detection method for use in cattle, sheep and goats. In heavily-infected herds, it may prove economical to remove all animals positive to this test, since many such animals, although negative to confirmatory tests (Serum Agglutination Test or Complemet Fixation Test), may be in the early stages of infection and likely to become dangerous in spreading brucellosis later (Zowghi and Ebadi 1985).

Brucellosis due to *Brucella melitensis* causes reproductive wastage and reduced milk production in affected livestock and is an important zoonosis. The disease in human beings is serious and long lasting and often results in chronic and disabling symptoms (Jackson et al. 2004).

Diagnosis of brucellosis however is often difficult to establish, largely through similarity with clinical presentations of other infections prevalent in sub-Saharan Africa such as malaria. Therefore laboratory testing is an absolute prerequisite for a proper diagnosis of human brucellosis and for detection and confirmation of brucellosis in animals. Laboratory diagnosis of brucellosis in animals or man may be achieved either through blood culture or serological testing (Smits and Cutler 2004).

This is a highly pathogenic zoonotic disease widely distributed throughout the world. A significant association found between seropositivity (presence of antibodies against *Brucella spp.*) and a history of abortions and retention of placenta in cows, indicates the impact of brucellosis on economical losses for farmers in the areas of infection (Mitrov et al. 2010).

The aim of this study was to determine the Investigation of brucellosis by MRT in cattle and sheep's in Urmia, Iran.

MATERIAL and METHOD

Collection samples:

Milk samples were collected from 1117 Cattle and 598 sheep from 100 different farms in spring, summer and autumn seasons in 2010.

Milk Ring Test:

The MRT works on the principle that antibodies to *B. abortus* attach themselves to fat globule agglutinins in milk which rise to the surface of the milk and cluster in the cream layer. When haematoxylin stained *B. abortus* antigen combines with brucella antibody (if present), a complex which adheres to the fat globules in the cream layer of milk is formed (Kang'ethe et al. 2000). The ring test was carried out by mixing 0.05 ml of suitably stained brucella antigen with 1 ml of well-mixed milk contained in a narrow test-tube. The tubes used were of a size to contain 1 ml. of milk in a column 2 cm high. The test was read after incubating at 37 °C for 40-60 min (Ferguson and Robertson 1953). After collection milk from animals, 2 ml of the milk samples of 1117 Cattle and 598 Sheep's from 100 Livestock was poured in test tube, and then MRT antigen was added to them. In the tests which were done on the milk sample of 1117 Cattle and 598 Sheep's from the 100 Livestock, there was found in different seasons.

RESULTS and DISCUSSION

In the tests which were done on the milk sample of 1117 Cattle and 598 Sheep's from the 100 Livestock, there was found in different seasons. For example from 1117 cattle samples, in Spring from 646 samples 10 , in summer from 248 samples 6 and in Autumn from 223 samples 2 was infected (Table 1) and from 598 sheep samples, in Spring from 598 samples 99 was infected (Table 2).

Table 1. MRT test positive samples from cattle in around Urmia-Iran

Season of the year	Samples (%)	
	Positive	Negative
Spring	10 (1.55)	636 (98.45)
Summer	6 (2.42)	242 (97.58)
Autumn	2 (0.90)	221 (99.10)
Total	18 (1.64)	1099 (98.36)

Table 2. MRT test positive samples from Sheep in around Urmia-Iran

Season of the year	Samples (%)	
	Positive	Negative
Spring	99 (16.55)	598 (83.45)

In this study, 1.64% of the milk samples from cattle and 16.55% of the milk samples from sheep tested with MRT were found to be positive for brucella antibodies. Fatma and Mahdey (2010) reported that prevalence of brucellosis in slaughtered cattle, sheep, buffaloes and goat in Egypt were found to be 4.0%, 3.7% and 4.45%; 5.0%, 5.9% and 6.4%; 7.6%, 9.0% and 10.2%; 8.8%, 11.4% and 10.6%, respectively. Another study (Kaoud et al. 2010) indicated that seropositivity for brucellosis in sheep, goat and cattle in Egypt were 26.66%, 18.88% and 17.22% respectively. A serological survey of brucellosis in livestock animals in Sarab City (East Azarbayjan province), in Iran, (Akbarmehr and Ghiyamirad, 2011), proved that the seropositivity of animals for brucellosis were 1.53% in male cattle, 3.92% in female cattle, 2.8% in male sheep, 4.89% female sheep 2.22% in male goats and 6.08% in female goats. In a previous study (Zowghi and Ebadi, 1985), serological investigations on brucellosis in cattle, sheep and goats in Iran showed that the seropositivity for brucellosis in cattle, sheep and goats was found to be 17.6% and 14.7% respectively. Jackson et al in 2004 reported that seroprevalence of brucellosis in sheep, goats and cattle in Kosovo were as 6.26%, 7.24% and 0.58% respectively. Mitrov et al in 2010 proved seroprevalence brucellosis in cattle in the Republic of Macedonia was in 0.83%.

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