Global Veterinaria 5 (2): 106-108, 2010
ISSN 1992-6197

Studies on the Prevalence of Brucellosis in Domesticated Animals During 2008 to 2009 at Mazandaran Province, Iran

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Abstract: Brucellosis is one of the common zoonotic diseases in human and domesticated animal which is caused by different species of the Gram negative brucella bacteria. This disease leads to repeated abortions and decline in milk production in domesticated animals. Also, because of probable infection of human societies, it has social and economic importance. During this study which was conducted from April 2008 to August 2009 on native and industrial cows and also sheep of Mazandaran province, 1863 cows including 679 (36.44%) industrial and 1184(63.56%) native and 1469 sheep were examined. Blood was taken from caudal vein of cows and jugular vein of sheep. After arrival of samples to laboratory sera were separated. Then samples were examined by screening test of Rosebangal and on positive samples Raight and 2ME tests were done. From the total 1863 examined cows, 94(5.04%) were positive including 22 (23.4%) industrial and 72(76.6%) native cows. Also. From 1469 sheep studied 358(24.37%) were infected with this agent. In conclusion, these findings showed broad contamination of domesticated animals which could be of great importance regarding hygiene of human societies.

Key words: Brucellosis · Domestic animals · Rosebengal · Raight · 2ME

INTRODUCTION

Brucellosis is one of the important zoonotic infectious diseases. The agent causing the disease is a bacterium from Brucella genus which has 6 species including *Brucella melitensis*, *B. abortus*, *B. suis*, *B. neotome*, *B. ovis* and *B. canis* and only *B. melitensis* is the most important agent responsible for this zoonotic disease. This bacterium is a Gram negative, non-motile, small cocobacil which has aerobic metabolism [1, 2]. Dissemination of brucellosis is global except for some countries which are free of the infection or were able to eradicate this contamination. Infected animals manifest symptoms such as abortion, orchititis, epididimitis, disorders of fertility and decline in milk production [3, 4].

Brucellosis was always given great attention in its economic and hygienic aspects, because infected domesticated animals usually have abortions during their first pregnancy and at the time of abortion and in a period of time after it they excrete severely contaminated uterus secretions which contaminate the environment, farms and grasslands which provide the condition for contamination of other animals of the herd and human as well [5].

Considering the rise in the rate of this disease during the past years according to reports from veterinary organization of the country, the mean rate of human contamination raised from 25 in 100,000 in year2003 to 32 in 100,000 in 2004[6].

So we decided to study and determine the rate of infection in domesticated animals of Mazandaran which are the source of human infection in this province.

MATERIALS AND METHODS

This cross-sectional study was carried out from April 2008 to August 2009 in different cities of Mazandaran province (Amol, Babol, Chalous, Babolsar, Savadkouh, Behshahr, Neka and Qaemshahr) on 1863 cows and 1469

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sheep. For this purpose, after consulting the statistical consulter, a number of different cities in the province were chosen and domesticated animals of those cities were sampled by cluster method. After determination of the herds first their data (including region, number of animals, spicies of animals, sex and history of the disease in the herd) were recorded. Then blood samples were taken from caudal vein of the cows and jagular vein of sheep, poured in sterile tubes and transferred to lab. Sera were separated by centrifugation at 2000g for 5min and then were stored in -70°C refrigerator until their examination. After collecting all the samples first they were screened by Rosebangal test and positive cases were examined with Raight and 2ME (2-mercaptoethanol) tests (according to instructions of the kit brochure which was manufactured by Iran Pasteur Institute). It must be mentioned that cow's samples were collected from industrial and native cows. In the end, the collected results were analyzed using SPSS, T test and Chi^2 square.

RESULTS

In this study, 1863 cows, including 679 industrial cows(36.44%) and 1184 native cows(63.56%) and also 1469 sheep were examined. 94(5.04%) of the 1863 industrial and native cows were diagnosed as positive, 22(23.4%) of them were industrial and 72(76.6%) were native. In 1496 sheep, 358(24.37%) were assessed as positive. Detailed data of the cities and cows and sheep are presented in Tables 1 and 2.

Considering the total number of examined cows, the rate of infection was 1.18 and 3.86%. In industrial and native cows, respectively Highest rate of infection was noticed in Amol city (2.09%) and the lowest rate was reported in Behshahr and Chalous cities (0.1%)(Table 1).

DISCUSSION

Brucellosis is a zoonotic disease which has acute, subacute and chronic forms. In animals, it mostly affects urogenital system. In human it causes fever, sweating, malaise and weight loss. This disease is an important zoontic disease, its control in animals will automatically result in reduction of the disease in human as well. For this purpose we must know more information about the disease in animals [7].

According to the study conducted by Ahmadieh [7, 8] during 1997-2001 in Kordestan province on domesticated animals infected with brucellosis 261 cows and 1530 sheep and goats were reported to be positive. The fact that rate of infection is higher in sheep and goats and *Brucella melitensis* which is the main agent of infection in human is seen more in these animals than cows shows the importance of these animals more than ever. This finding is in accordance with what was seen in the present study.

Another study was conducted by Faiuzi in 2007 in Golestan province on the cows of that region. They examined 986 industrial cows and 932 native cows. They reported the rate of infection 1.62% in industrial cows and

Table 1: Determination of infection rate in industrial and native cows of Mazandaran province according to cities from April 2008 to August 2009

City	Number of examined cows	Number of industrial cows	Number of native cows	Number of infected cows(industrial and native)	Accumulative frequency
Amol	681	177	504	39(2.09%)	681
Savadkouh	157	64	93	13(0.69%)	838
Neka	116	51	65	3(0.16%)	954
Babol	37	1	36	23(1.23%)	991
Babolsar	804	465	339	9(0.48%)	1795
Behshahr	38	36	2	2(0.1%)	1833
Qaemshahr	10	4	6	3(0.16%)	1843
Chalous	20	7	13	2(0.1%)	1863

Table 2: Determination of infection rate in sheep of Mazandaran province according to cities from April 2008 to August 2009

City	Number of examined sheep	Number of infected sheep	Accumulative frequency
Amol	270	70(25.92%)	270
Behshahr	387	240(63.5%)	648
Neka	600	9(1.5%)	1248
Noshahr	144	24(16.6%)	1392
Babol	27	12(44.4%)	1419
Tonekabon	50	3(0.6%)	1469

0.55% in native cows while in the present study the rate of infection was 1.18% in industrial cows and 3.86% in native cows which the difference between native cows could be due to the different conditions they are kept in these two places [9].

In al-majali's 2009 study in Jordan by ELISA technique on cows of that region 68(10.1%) of 671studied cows were reported to be positive which the higher rate of infection in that region in comparison to the present study could be because of higher prevalence of the disease or using ELISA technique which has higher sensitivity and specificity than Raight and 2-mercaptoethanol tests [10]. According to the results of this study we suggest that more attention must be paid to vaccination issue and after vaccination Veterinary Center should follow the domesticated animals to make sure they will not get infected and are resistant to the disease. With educational programs we can increase people's knowledge about this disease, especially in schools. The more important issue is more careful surveillance on dairy products workshops and their preparation and dispensation of these products, because they can be one of main sources of infection in human population.

ACKNOWLEDGEMENT

The authors would like to thanks Dr. Sarafrazi in control disease in Mazandaran province and Ms.Amini in Pasteur institute of Iran-Amol research center performing the laboratory procedure.

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