

## Brucellosis Seroprevalance on Goats, Sheep, Cows and Man who are under Risk in Diyarbakir Region

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**Abstract:** The aim of this study was to determine the prevalence of brucellosis in sheep, goats, cows and human who are at risk in Diyarbakir region. From ten locations obtained in Diyarbakir, blood samples were collected from sheep, goats and cows belonging to different herds and man who are at risk between 2007 and 2009 years. The blood samples were tested using the Microagglutination (MAT) technique. Seropositivity by using MAT technique on the collected blood samples were positive on 60 (35.2%) of 170 sera taken from the veterinarian, slaughterhouse staff, butchers and growers. Also the positivity rates were 20 (2.9%) of 680, 5 (0.7%) of 725 and 25 (4.3%) of 575 for sera samples taken from cows, sheep and goats, respectively. Consequently, seropositivity is obtained high for animals and individuals who are under risk according to the other regions in Turkey. It is considered that brucellosis can be decreased by informing the individuals who are under risk about the infection of this illness and the works about this subject.

**Key words:** Brucellosis, cow, goat, human, seroprevalance, sheep

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### INTRODUCTION

Brucellosis is a common zoonotic infection which leads to important economic losses in many countries (Junaidu *et al.*, 2006; Abd El-Razik *et al.*, 2007). Also this infection causes losses in breeding production as abortions, milk production deficiency, stud value decreasing, infertility, treatment and vaccination costs while direct contact with infected animals or consuming contaminated milk or milk productions form an important society health problem (Majaali *et al.*, 2009; Carter and Cole, 1991).

Direct diagnosis of brucellosis is done by using agent isolation whereas several tests such as blood serum, milk, milk serum, vaginal mucus and seminal plasma can be used for indirect diagnosing. Also Rose Bengal Plate Test (RBPT), ELISA, Complement Fixation Test (CFT) and Serum Agglutination Test (SAT) are used in indirect diagnosing of the infection. SAT can be applied as macro or micro. Macro Serum Agglutination test has a disadvantage in processing many samples due to the fact that too many serums, pipettes and antibodies are needed. On the other hand, MAT test is a proper test for assessing many samples in microplates with fewer serums, antibodies (Young, 1991). In this study it is aimed to obtain the seroprevalance of brucellosis in sheep, goats, cows and human who are at risk in Diyarbakir region of Turkey.

### MATERIALS AND METHODS

**Serum samples:** From ten locations in Diyarbakir, blood samples were collected from 680 cows, 725 sheep and 575 goats belonging to different flocks between 2007 and 2009. Also blood samples of 170 people (53 veterinarians, 67 breeders, 13 butchers and 37 slaughterhouse workers) were taken. The serum from the blood samples were conserved at -80°C after centrifuging at 1500 rpm.

**MAT:** MAT Technique was performed according to Baum *et al.* (1995) *Brucella abortus* S99 strain provided form Refik Saydam Hifzissihha Center was used as antigen.

In assessment state, all the animals were assumed as unvaccinated since, vaccination condition of animals weren't determined clearly. Besides 1/40 or higher values of serum titers were accepted as positive for both animals and people (Aydin and Paracikoglu, 2006; Baum *et al.*, 1995).

### RESULTS AND DISCUSSION

In this study 5 sheep (0.7%), 25 goats (4.3%) and 20 cows (2.9%) were tested as positive using MAT. The obtained titres are shown in Table 1.

During the research blood samples were taken from total 170 people as 53 veterinarians, 67 breeders, 13 butchers and 37 slaughterhouse workers. About 24 (4.52%) of veterinarian (19, 1, 2 and 2 of them had 1/40, 1/80, 1/160 and 1/320 titres, respectively) and 16 (23.69%) of breeders (4, 6, 5 and 1 of them had 1/40, 1/80, 1/160 and 1/320 titers, respectively). In addition, 17 (46%) of slaughterhouse workers them had 1/40 seropositivity ratio whereas this ratio were 1/80 in 3 (23.1%) of butchers. The seropositivity ratios associated with them are shown in Table 2.

Brucellosis still keeps its importance despite epidemiologic works, animal vaccination and the other measures for Turkey, especially Diyarbakir region. Non-controlled animal mobility, traditional stock breeding and traditional food consuming in Diyarbakir region always sets agenda for brucellosis as a health threatening matter.

Seropositivity of brucellosis in sheep is reported in the range of 0.7-14% (Omer *et al.*, 2000; Reviriego *et al.*, 2000; Samaha *et al.*, 2009). In Turkey, various researches for brucellosis epidemiology in sheep were also done. Iyisan obtained seropositivity as 6% in Ankara and 8.3% in Kayseri by RBPT and Inci reported it as 7.79% in Kayseri. In another study Ceylan obtained seropositivity as 19.6% by RBPT and 22.9% by SAT in Van. Also Keskin reported seropositivity as 23.5, 22.2 and 22.0% by RBPT, SAT and ELISA, respectively in Sanliurfa region. In this study, seropositivity was detected in 0.7% of sheep as 1/40 and this ratio is compatible with the seropositivity ratio reported by Reviriego *et al.* (2000) However, it is quite lower than both the studies done in Turkey or in other

countries. In the studies done for obtaining the brucellosis seropositivity in goats in various regions of the world determined seropositivity ratios were reported in the range of 0.1-3.8% (Omer *et al.*, 2000; Reviriego *et al.*, 2000; Samaha *et al.*, 2009). Different seropositivity ratios were reported in some studies done in goats for Turkey. Ceylan obtained the ratio as 21.5% by RBPT in Van and 24.8% by MAT in Ankara. In addition, Keskin reported the seropositivity ratio as 15.5% by RBPT, 15.2% by SAT and 25.2% by ELISA in Sanliurfa. In this study seropositivity equal to or >1/40 was found in 4.3% of goats. This value is compatible with some researchers (Omer *et al.*, 2000; Samaha *et al.*, 2009) while it is quite lower than the ratio which Ural *et al.* (2009) determined in Turkey.

It is considered that the lower seropositivity ratio, obtained for sheep and goat can be caused by brucellosis control work success in the last two decades.

Brucellosis seropositivity of cows was reported as 4.98% by RBPT, 4.73% by CFT and 4.48% by Rivanol Tests (RT) in Egypt (Samaha *et al.*, 2009). Also Behre *et al.* (2007) reported it as 3.3% by RBPT and as 3.19% by CFT in Ethiopia. In Turkey, the researches, done for brucellosis seropositivity of cows, the seropositivity ratio was 20.9% by RBPT and 21.7% by SAT in Van region 32.92% by RBPT and 34.64% by STA in Kars region (Otlu *et al.*, 2008) and 3.3% by RBPT, 4.55 by SAT and 5.33 by ELISA. In the presented research, seropositivity were obtained as 1/40 or higher in 2.9% of cows. This value was generally compatible with the other studies while it was quite lower than the ratios, obtained by Otlu *et al.* (2008). The higher ratios in the researches (Otlu *et al.*, 2008) can be caused by the fact that Van and Kars cities are in the border region, amount of animals and mobility of them are higher.

Existence of brucellosis among animals forms a risk factor for veterinarians, butchers, slaughterhouse workers and breeders. In several studies, higher seropositivity ratios were detected (Cetinkaya *et al.*, 2005; Otlu *et al.*, 2008). Seroprevalance of the brucellosis differs according to countries and regions while it shows

Table 1: Disturbance of brucellosis seropositivity in sheep, goats and cows in Diyarbakir

| Titer    | Sheep  |       | Goat   |       | Cow    |      |
|----------|--------|-------|--------|-------|--------|------|
|          | Number | %     | Number | %     | Number | %    |
| Negative | 395    | 54.5  | 320    | 55.7  | 221    | 32.5 |
| 1/5      | 161    | 22.2  | 129    | 22.4  | 319    | 46.9 |
| 1/10     | 124    | 17.1  | 76     | 13.2  | 78     | 11.4 |
| 1/20     | 40     | 5.5   | 25     | 4.3   | 42     | 6.1  |
| 1/40     | 5      | 0.7   | 20     | 3.5   | 20     | 2.9  |
| 1/80     | -      | 0.0   | 3      | 0.5   | -      | 0.0  |
| 1/160    | -      | 0.0   | 2      | 0.3   | -      | 0.0  |
| Total    | 725    | 100.0 | 575    | 100.0 | 680    | -    |

Table 2: Brucellosis seropositivity in people who are under risk

| Results  | Veterinarians |            | Breeders |            | Butchers |            | Slaughterhouse workers |            |
|----------|---------------|------------|----------|------------|----------|------------|------------------------|------------|
|          | Number        | Percentage | Number   | Percentage | Number   | Percentage | Number                 | Percentage |
| Negative | 3             | 5.7        | 17       | 25.4       | -        | 0.0        | 10                     | 27.0       |
| 1/20     | 26            | 49.1       | 34       | 50.7       | 10       | 76.9       | 10                     | 27.0       |
| 1/40     | 19            | 35.7       | 4        | 6.0        | -        | 0.0        | 17                     | 46.0       |
| 1/80     | 1             | 1.9        | 6        | 8.9        | 3        | 23.1       | -                      | 0.0        |
| 1/160    | 2             | 3.8        | 5        | 7.5        | -        | 0.0        | -                      | 0.0        |
| 1/320    | 2             | 3.8        | 1        | 1.5        | -        | 0.0        | -                      | 0.0        |
| Total    | 53            | 100.0      | 67       | 100.0      | 13       | 100.0      | 37                     | 100.0      |

occupational disease characteristics in developed countries (Atmaca *et al.*, 2004; Canova *et al.*, 1993; Eriksen *et al.*, 2002; Kose *et al.*, 2006). Samaha *et al.* (2009) determined brucellosis seropositivity (6.6, 8, 8 and 5% by SAT, Buffered Acidified Plate Antigen (BAPA), RBPT and RT test, respectively) in 100 people who contacted animals directly or indirectly. In Turkey, different results were obtained from different regions. Ceylan reported brucellosis seropositivity as 26.7% by RBPT and 27.2% by SAT in breeders. Altindis obtained seropositivity as 13.3% in animal breeders, 8.6% in milk production collectors and 15.7% in factory stuff in Afyon city. In Kars region, Otlu *et al.* (2008) reported seropositivity in 246 farmers in risk group as 1.30, 14.2 and 17.9% by RBPT, SAT and ELISA, respectively. In addition, one of each three veterinarians among total 26 people is found to be seropositive in the study.

In this study, 1/40 or higher seropositivity was detected in 45.3% of veterinarians, 23.69% of breeders, 46.0% of slaughterhouse workers and 23.1% of butchers who are under risk group. In addition, these ratios are quite higher than the values obtained in the studies done in various countries (Cetinkaya *et al.*, 2005; Eriksen *et al.*, 2002; Samaha *et al.*, 2009). However, the results are compatible with the researchs done among veterinarians and breeders in Van and Kars cities (Otlu *et al.*, 2008). On the contrary, they are higher than according to the results of the research done in Afyon region. Therefore, it can be said that whether the staff in the risk group or people in East or Southeast region of Turkey have more risks to encounter brucellosis infection. These conditions can be resulted due the facts that lower socioeconomic status, uncontrolled animal mobility, illegal and uncontrolled slaughter and meat marketing, consuming raw milk, milk productions without pasteurizing, knowledge deficiency of people for this infection and improper infection alarm system.

### CONCLUSION

Consequently brucellosis is still society health problem in this region although, the decrease are faced in the seropositivity ratios of animals. Cooperation of health, educational, agricultural ministries and the local associated offices will aid to control brucellosis. Also preventing the illegal slaughter, meat marketing, making people conscious of not consuming raw milk and milk productions will provide an important contribution in controlling brucellosis.

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