

Identification of the Brucellosis Cases in Burdur City, Turkey Between the Years 2007-2015

2007-2015 Yılları Arasında Türkiye’de Burdur İlindeki Bruselloz Vakalarının Tanımlanması

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Summary

Objective: This study was made to determine the Brucellosis cases in Burdur province located in the South-east of Turkey, between the years 2007 and 2015.

Material and Method: The Brucellosis case notifications, which were made to City Health Administrative between the years 2007 and 2008, and to Burdur Public Health Administrative since 2009, were evaluated according to the features of the individual, place and time in this descriptive study. The data of the research were evaluated via SPSS for Windows 17 statistical package programme. The nominal data were shown as frequency and percentage.

Results: Total number of cases between the years 2007 and 2015 was 493, and 55.2% of the cases were males (n:272) while 44.8% of them were females (n:221). The determination of potential and certain cases began in Burdur in 2009 and most of the certain disease diagnoses were made in 2012 with 71 person (23.2%).

Conclusion: Due to the fact that Brucellosis is a very common zoonotic illness, clarification of diagnostic system affects human health in a positive way especially in the areas where the live stock and the illness are intense. However, the same sensitivity should be developed against animal Brucellosis as well.

Key words: Brucella, Burdur, certain case, potential case, standard tube agglutination test, Turkey.

Özet

Amaç: Bu çalışma 2007-2015 yılları arasında Türkiye’nin güneybatısındaki, Burdur ilindeki Bruselloz vakalarının tanımlanması amacı ile yapılmıştır.

Gereç ve Yöntem: 2007-2008 yıllarında İl Sağlık Müdürlüğü’ne ve 2009 yılından sonra Burdur Halk Sağlığı Müdürlüğü’ne yapılmış olan tüm başvurular; bireysel özellikler, yer ve zaman anlamında bu deskriptif çalışmada incelendi. Çalışma verileri SPSS Windows 17 istatistik paket programı ile değerlendirildi. Nominal veriler sıklık ve yüzde şeklinde verildi.

Bulgular: 2007-2015 yılları, toplam vaka sayısı 493’tür. Vakaların %55,2 (n:272)’sini erkekler, %44,8 (n:221)’ini kadınlar oluşturmaktadır. Olası ve kesin vaka ayırımına, Burdur ilinde, 2009 yılında başlanmış olup, en fazla kesin vaka tanısı 2012 yılında 71 kişiye (%23,2) konuldu.

Sonuç: Bruselloz oldukça yaygın bir zoonotik hastalık olması dolayısıyla, özellikle hayvancılığın ve hastalığın yoğun olduğu bölgelerde, tanı sisteminin netlik kazanması insan sağlığını olumlu etkilemektedir. Ancak, aynı hassasiyet, hayvan Bruselloz’u içinde geliştirilmelidir.

Anahtar Kelimeler: Brusella, Burdur, kesin vaka, olası vaka, standart tüp aglütinasyon testi, Turkey.

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Introduction

Brucellosis, which was firstly defined as “Mediterranean gastric remitten fever” by Marstonin 1859, is considered to be the most common zoonotic disease in the world. It is widely seen in Mediteranean countries, Arabic peninsula, India, Africa and South America. Although Brucellosis has been eradicated in developed

countries, it is still an important public health problem in the developing countries (1). It is an infectious disease with a rather high morbidity and low mortality (2). Brucellosis is a zoonosis caused by bacteria of the genus Brucella, which affect both human and animals such as the cow, sheep, goat, camel and pig. Bacteria enters the host through the digestive tract via contaminated dairy products, the respiratory tract via aerosols, or the skin via

contact with infected animals on farms in slaughter houses. Since the symptoms of brucellosis are non-specific, the clinical diagnosis of the disease is difficult. Therefore the diagnosis must be supported and confirmed by the isolation of the agent, mostly from blood culture or by the detection of antibodies against bacterial antigens (3).

Brucellosis has an important effect on human health and animal industry all over the world. It is a notifiable disease in many countries. Precautions related to control, depend on protectional grounds. Surveillance is a basis for the guidance of protection and control programs (4). Brucellosis is an important public health problem and the data regarding the epidemiology of the disease are of significance. According to the data of the Ministry of Health, in Burdur, the Brucellosis incidence in human is 100-200 per hundred thousand; the Brucellosis prevalence in cattle is 0-1% and in sheep 5-10% (5).

According to the data of our country, in Burdur, which seems to have a medium loaded Brucellosis case, it was aimed that nine years of assessment should be made in order to make the diagnosis for Brucellosis cases in province centre and around Burdur.

Material and Methods

Burdur is a city located in the South-west of Turkey and occupied with livestock. Burdur has a medium-heavy Brucellosis notification in Turkey for the cases of Brucellosis. As a notifiable disease, Brucellosis was asked in the Notification Sistem Guidance published by the Ministry of Health in 2004 to be reported to the City Health Administrative as a potential or certain case (4).

As a clinical definition, the Ministry used the definition as such: along with the history of occupation of livestock, occupational touch or consumption of infectious animal products (diary products, especially fresh cheese); it is a disease characterized by acute or insidiously started, continuous or an isochronous intermittant to irregular fever, fatigue, anorexia, loss of weight, headache, sweating –at night specially-, muscle and joint aches. As a laboratory criteria for supporting diagnosis (was possible), Rose-Bengal test and as a laboratory criteria for the antidote positiveness and confirming diagnosis,

the isolation of *Brucella* species (spp) from clinical samples [was possible]; for the phenomena without a treatment history, antidot titer is accepted to be $>1/160$ through standard tube agglutination test (STA) in one serum sample; ≥ 4 times increase was acceptable in *Brucella* STA titer in double serum sample taken at least very two months. As a result, in the classification of cases were as such; potential case, was accepted to be a case confirming clinical definitin and found positive with the supportive laboratory test. Certain case, was accepted to be a case confirming clinical definition and with at least one positive confirming laboratory criteria (4).

It was decided that Brucellosis cases should be reported as a potential or certain case to the City Health Administrative with the Notifiable Diseases Form. In the second stage, the cases regarding the filiation report are evaluated by Public Health Centers. In Burdur province, the notifications were made regardless of the separation between potential and certain cases in 2007 and 2008. Since 2009, notifications has been made with the separation of potential and certain cases by all health institutions (4). The Brucellosis case notifications, which were made to City Health Administrative between the years 2007 and 2008, and to Burdur Public Health Administrative since 2009, were evaluated according to the features of the individual, place and time in this descriptive study. The data of the research were evaluated via SPSS for Windows 17 statistical package programme. The nominal data were shown as frequency and percentage.

Results

As the Brucellosis cases in Burdur province were evaluated according to the years and genders, it was observed that the number of male cases (55.2%) was more than that of women, and the number of both cases fluctuated during the years (Table 1). As the number of potential and certain cases were observed, it was determined that certain cases increased in terms of years, and the potential and certain case notifications were made mostly in April, May and June with a rate over 10% (Table 2, Table 3). When we evaluated *Brucella* cases according to the districts of Burdur, it was observed that the number of potential and certain case notifications from Central, Bucak and Gölhisar districts –where population densities are high – were more as

compared to other districts and that the case notifications were more for the groups at the age

of 30 and +30 than other age groups (Table 4, Table 5).

Table 1. Gender distribution of the total number of cases during the years

Years		Gender distribution		Total
		Men	Women	
2007	N	14	11	25
	%	56.0%	44.0%	100.0%
2008	n	45	33	78
	%	57.7%	42.3%	100.0%
2009	N	16	9	25
	%	64.0%	36.0%	100.0%
2010	N	25	22	47
	%	53.2%	46.8%	100.0%
2011	n	54	41	95
	%	56.8%	43.2%	100.0%
2012	N	51	30	81
	%	63.0%	37.0%	100.0%
2013	N	34	34	68
	%	50.0%	50.0%	100.0%
2014	N	23	32	55
	%	41.8%	58.2%	100.0%
2015	N	10	9	19
	%	52.6%	47.4%	100.0%
Total	N	272	221	493
	%	55.2%	44.8%	100.0%

Table 2. The distribution of possible and definite cases during the years

Years		Definite cases	Possible cases	Total
2009	N	17	8	25
	%	5.6%	9.5%	6.4%
2010	N	35	12	47
	%	11.4%	14.3%	12.1%
2011	N	55	40	95
	%	18.0%	47.6%	24.4%
2012	N	71	10	81
	%	23.2%	11.9%	20.8%
2013	N	64	4	68
	%	20.9%	4.8%	17.4%
2014	N	50	5	55
	%	16.3%	6.0%	14.1%
2015	N	14	5	19
	%	4.6%	6.0%	4.9%
Total	N	306	84	390
	%	100.0%	100.0%	100.0%

Table 3. The distribution of possible and definite cases during the months

Months		Definite cases	Possible cases	Total
January	N	19	14	33
	%	6.2%	16.7%	8.5%
February	N	17	9	26
	%	5.6%	10.7%	6.7%
March	N	31	7	38
	%	10.1%	8.3%	9.7%
April	N	42	5	47
	%	13.7%	6.0%	12.1%
May	N	35	13	48
	%	11.4%	15.5%	12.3%
June	N	46	6	52
	%	15.0%	7.1%	13.3%
July	N	26	7	33
	%	8.5%	8.3%	8.5%
August	N	28	8	36
	%	9.2%	9.5%	9.2%
September	N	19	5	24
	%	6.2%	6.0%	6.2%
October	N	14	5	19
	%	4.6%	6.0%	4.9%
November	N	18	2	20
	%	5.9%	2.4%	5.1%
December	N	11	3	14
	%	3.6%	3.6%	3.6%
Total	N	306	84	390
	%	100.0%	100.0%	100.0%

Table 4. The distribution of possible and definite cases of Burdur's districts

Districts		Definite cases	Possible cases	Total
Ağlasun	N	3	1	4
	%	1.0%	1.2%	1.0%
Altınyayla	N	10	1	11
	%	3.3%	1.2%	2.8%
Bucak	N	39	16	55
	%	12.7%	19.0%	14.1%
Çavdır	N	13	3	16
	%	4.2%	3.6%	4.1%
Çeltikçi	N	1	2	3
	%	.3%	2.4%	.8%
Göhlisar	N	58	12	70
	%	19.0%	14.3%	17.9%
Karamanlı	N	9	4	13
	%	2.9%	4.8%	3.3%
Kemer	N	5	1	6
	%	1.6%	1.2%	1.5%
Merkez	N	112	36	145
	%	36.6%	42.9%	37.2%
Tefenni	N	30	1	31
	%	9.8%	1.2%	7.9%
Yeşilova	N	26	7	33
	%	8.5%	8.3%	8.5%
Total	N	306	84	390
	%	100.0%	100.0%	100.0%

Table5. The distribution of possible and definite cases of age groups

Age groups		Definite cases	Possible cases	Total
0-19	N	26	8	34
	%	8.5%	9.5%	8.7%
20-29	N	31	12	43
	%	10.1%	14.3%	11.0%
30-39	N	59	15	74
	%	19.3%	17.9%	19.0%
40-49	N	56	20	76
	%	18.3%	23.8%	19.5%
50-59	N	73	14	87
	%	23.9%	16.7%	22.3%
60 andover	N	61	15	76
	%	19.9%	17.9%	19.5%
Total	N	306	84	390
	%	100.0%	100.0%	100.0%

Discussion

Although seen rarely in developed countries; this disease is quite common in Portugal, Spain, Italy, Greece, North African countries and the Mediterannian Basin including Turkey, Arabic Peninsula, India, Middle and South America (6). Due to its location in the Mediterannean Basin, Turkey is in a zone where Brusellosis is frequently seen. Infact, considering the cases with Brusellosis diagnosis, it can be concluded that 10-15% of the mare children, 50-60% are between the ages 20 and 50 and 10% of the mare over 65. Especially in endemic countries, brucellosis affects productive age groups and causes significant morbidity and economic losses. While Brusellosis is a rarely seen disease during childhood in developed countries; it can be seen at anyage in developing countries such as Turkey (5).

In some studies, it has been estimated that in endemic regions, quarter of the patients are younger than 14 years. Actually the rate of childhood brucellosis in endemic regions is reported to be from 11% to 56% (7). Performed study shows this common acceptance as well. This study includes 8.5% certainly diagnosed, 9.5% potentially diagnosed and in total 8.7% people underage 19.

In the countries, where Brusellosis has a low incidence, the disease is more common among males due to the occupational risks. However, it is known that in endemic countries there is no

gender difference (5). Most of the studies show similar gender involvement in Brusellosis, where as only small number of studies have shown higher involvement in one of the genders (8). In the study both genders had nearly similar involvement rates (males 55.2%, females 44.8%), but still, considering the fact that males are more occupied with livestock, we are on the point that this little difference might be due to the occupational risks; because Burdur is a city where livestock and dairy products are common as a profession.

As the number of Brusellosis cases reported to the Turkey Ministry of Health were observed in terms of years, it was seen that while this number was 186 in 1980, it peaked and reached 17765 in 2002. The reason of the increase in case numbers as the years passed, could be attributed to conducting a more regular notification system. According to the national data published by the Minsitry of Health lastly in 2009, it was reported that there were 9371 Brusellosis cases in total, 4379 of whom were males and 4992 were females. Indifferent studies, it was seen that the cases in Turkey were frequently from Southeast Anatolia region (49.2%), East Anatolia region (21.7%), Central Anatolia region (19.9%) and Eagean region (5.0%); the notifications were made at rather low frequency from Black Sea region (0.1%) (1). In several studies made to determine Brusellosis prevelance, the rates are as follows: 3% in Kırşehir Demir et al (6); 15% in Sivas Alim et. Al (9); 5.7% in Manisa (10). The number of potential and certain diagnoses were

seen to increase yearly in the study, therefore it was thought that the applications defined in the Notification System Guide by the Ministry of Health in 2004 were made accurately and dealt with seriously, and there was an increase in awareness. In this respect, it is also possible that the disease has not become widespread but better known and diagnosed.

Again; according to the data of the Ministry of Health, the Brucellosis incidence in human is 100-200 per a hundred thousand; the Brucellosis prevalence in cattle is 0-1% and in sheep is 5-10% (5). In other words, it seems significant for sheep, goat and domestic animals to be controlled in this respect in order to protect human from Brucellosis. Because, two thousand eight hundred sixty nine cattle blood serum samples were collected from 55 dairy cattle herds selected and were examined for Brucellosis in Burdur. Herd level seroprevalence was found to be 56.4%, 38.2% and 43.6% through Rose Bengal Plate Test (RBPT), Acidified Rose Bengal Plate Test (ARBPT) and Serum Agglutination Test (SAT), respectively. Individual animal seroprevalence was found as 6.8% by SAT (11). There have been several studies on herd size as a risk factor to brucellosis in cattle populations in different parts of the world, especially in the countries where brucellosis is highly prevalent in cattle populations, and they found similar results (12-14). This result in animal Brucellosis supports the performed study in that the places where the placement of herds and seroprevalence at herd level were high for dairy cattles in Burdur province were Gölhisar, Yeşilova, Center, Karamanlı and Bucak districts (11), however the places where individual animal seroprevalence was high were Center, Gölhisar and Yeşilova districts. Also in the study, the potential and certain diagnosed Brucella diseases were higher in Center, Gölhisar and Bucak districts. As a matter of fact, Aral et. al. (15) in their study conducted in Kahramanmaraş determined 0.4% seropositivity with the ones consuming boiled milk and not consuming fresh cheese but 35% seropositivity with the ones consuming milk without boiling and consuming fresh cheese. Büke et. al. From Egean region found the Brucellosis prevalence as 3.3% in the dairy products processors in four districts of İzmir (16). Moreover, according to the data obtained from the Ministry of Health in 2004, while the Brucellosis load in Afyonkarahisar province was

similar to that of Burdur (5), in the study on the serum samples from the cows in six dairy farms with abortion history in Afyonkarahisar province, located in west of Turkey, all serum samples (100%) gave positive results in RBPT (11). As a result of the study on occupations dealing with animals and animal products in Afyonkarahisar and around, where livestock was common in the centers, it was determined that stockbreeders had seropositivity prevalence with a rate of 13.3%, butchers with 8.6% and the ones working at dairy products factories with 15.7% (17). In a study made by Demirdal and Demirtürk in the same city (Afyonkarahisar), 377 serum samples were evaluated through STA and a lower rate (4.8%) of seropositivity were found (18). These results support the performed study and show the necessity of animal vaccinations and controls of herds, justlike in humans.

Additionally; the studies on the contamination ways of Brucellosis in Turkey found out that the consumption of raw milk and dairy products was the first reason in Brucellosis infection with the following rates: Taşbakan's study (n:109) in İzmir (19), 67.9%, Kosar's study (N:280) in Isparta, 30% (20). Also, the observation in our study that potential and certain cases were 37.7% in April-June seems to support the contamination through milk and dairy products, justlike in other countries. The disease acquisition according to the season is 54% during the period March-June in Greece, 71% during June-September in Israel, and predominately April-August in Irland Jordan (7).

Brucellosis occurs as a problem against public health and animal health in our country and other places where the disease is frequently seen. The program of the Ministry of Health prepared by clarifying the diagnosis criteria of Brucellosis which is among the notifiable diseases seems to be effective. However, the problem will be solved when the Brucellosis observed in animals is controlled. In this respect, we are on the point that politics of the Ministry of Health together with the Ministry of Agriculture and Livestock and University projects to be planned along with educational supports would produce results and health in order to obtain changes in behaviour.

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