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Epidemiological Characteristics of Tularemia in Kosova in the Period 2006-2011

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ABSTRACT

Introduction: Tularemia is an important zoonosis in Kosovo. The first cases of tularemia in Kosovo were reported in 1999 among civil population in the west part of Kosovo. Tularemia has become an important problem in Kosova after 1999. **Aim:** The aim of this study was to analyze the frequency and distribution of Tularemia in Kosovo in the period from 2006 to 2011, propose measures and activities for prevention and control of the disease. **Material and method.** In this descriptive, retrospective study, we used official reports on infectious diseases from National Institute of Public Health of Kosova (NIPHK), as well as epidemiological surveys. The data collected were analyzed and the corresponding statistical parameters were tested with SPSS for the level of significance for P<0.01 and P<0.05. **Results and Discussion:** The morbidity rate over the study period ranged from 0.38 (2011) to 11.26 (2010) per 100000 inhabitants. We found statistical significance between years for the level of P<0.00001. (X^2-test=387.5; DF=5; P<0.0001). The majority of tularemia cases occurred in female (59%) with statistical significance for P<0.001 (X2-test=16.07; DF=1; P<0.001) The peak of cases in age group 20-40 years, with 242 cases or 48%, with statistical significance for the level of P<0.0001 (X^2-test=253.14; DF=3; P<0.001) The main route of human infection is consumption of no safety water from wells (50%). The majority of tularemia cases occurred in female in Kosovo with 59% of observed cases while in a study in Central Anatolia region 54.7% were female. **Conclusion:** Kosova is an endemic zone of this disease since 1954 where the first cases were registered. Tularemia is a zoonosis, so in order to avoid human infections it is very important to implement measures well as perform public health education activities.

Key words: Tularemia, morbidity, Kosova .

1. INTRODUCTION

Tularemia is an infection common in wild rodents that is passed to humans through contact with infected animal tissues or by ticks, biting flies, and mosquitoes. Tularemia is caused by the bacterium Francisella tularensis. Humans can get the disease through: a bite from an infected tick, horsefly, or mosquito, breathing in infected dirt or plant material, direct contact, through a break in the skin, with an infected animal or its dead body (most often a rabbit, muskrat, beaver, or squirrel), eating infected meat (rare).

The disorder most commonly occurs in North America and parts of Europe and Asia. Although outbreaks can occur in the United States, they are rare (1).

Some people may develop pneumonia after breathing in infected dirt or plant material. This is known to occur on Martha's Vineyard, where bacteria are present in rabbits, raccoons, and skunks. *Francisella tularensis* is considered a potential bioterrorism agent. An aerosol release would be a possible method of infection. Pneumonia cases would start 1–10 days after people were exposed. Laboratory confirmation: blood for tularemia bacteria, blood test measuring the body's immune response to the infection (serology for tularemia), Chest x-ray, Polymerase chain reaction (PCR) test of a sample from an ulcer. This disease may also affect the results of febrile agglutinins and some tests for infectious mononucleosis (1).

Tularemia is fatal in about 5% of untreated cases, and in less than 1% of treated cases. A vaccine is recommended for people at high risk (trappers, hunters, and laboratory workers who work with the bacteria)(1).

2. AIM

Since 1999 tularemia has been known to be endemic in Kosovo, the number of infected people has rapidly increased and tularemia has become a very important public health problem.

The aim of this study was to analyze the frequency and distribution of Tularemia in Kosovo in the period from 2006 to 2011, propose measures and activities for prevention and control of the disease.

A new surveillance system has been implemented in Kosovo to report a number of diseases including tularaemia.

3. MATERIALS AND METHODS

In this descriptive, retrospective study, we used official reports on infectious diseases from National Institute of Public Health of Kosova (NIPHK), as well as epidemiological surveys.

All ambulances and medical centres (regional and municipalities level), were obliged to fill in special reporting forms every week to report aggregated and individual data of a number of diseases, including tularaemia, to the regional IPH which, subsequently, passed them to the NIPHK.

The ELISA was performed as the antibody screening assay.

The data collected were analyzed and the corresponding statistical parameters were tested with SPSS for the level of significance for $P<0.01$ and $P<0.05$.

4. RESULTS

In the period 2006-2011, there were 504 tularemia cases and the number of cases has changed from through years. The morbidity rate over the study period ranged from 0.38 (2011) to 11.26 (2010) per 100000 inhabitants. We found statistical significance between years for the level of $P<0.00001$. (X^2-test=387.5; DF=5; $P<0.0001$) (Table 1 and Figure 1).

Years	Cases		Mb	X^2-test
	N	%	100 000	
2006	85	16.9	4.04	X2-test=387.9; DF=5; P<0.00001
2007	40	7.9	1.9	
2008	46	9.1	2.19	
2009	88	17.5	4.18	
2010	237	47	11.26	
2011	8	1.6	0.38	
Total	**504**	**100**	-	-

Table 1. Number of tularemia cases in Kosova, 2006-2011

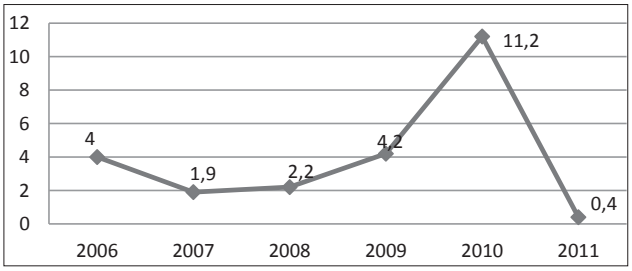

Figure 1. Incidenca tularemia cases in Kosova, 2006-2011

The majority of tularemia cases occurred in female (59%) with statistical significance for $P<0.001$ (X2-test=16.07; DF=1; P<0.001) (Figure 2).

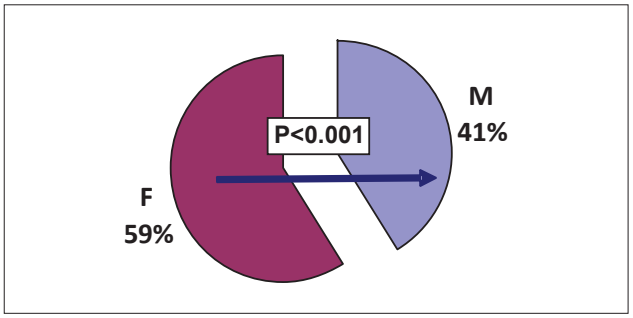

Figure 2. Tularemia cases Kosovo, 2006-2011, by gender

All age groups were attacked by this disease (Table 2) with the peak of cases in age group 20-40 years, with 242 cases or 48%. After testing we found statistical significance for the level of $P<0.0001$ (X^2-test=253.14; DF=3; P<0.001)

Age group	Cases						Total	
	2006	2007	2008	2009	2010	2011	N	%
0 – 10	8	1	3	6	6	0	24	4.8
11 – 19	15	4	3	13	19	2	56	11.1
20 – 40	41	20	23	44	109	5	242	48
41+	21	15	17	25	103	1	182	36.1
Total	85	40	46	88	237	8	504	100
X2-test							X^2-test=253.14; DF=3; P<0.00001	-

Table 2. Tularemia cases by age group Kosovo, 2006-2011

Housewives and farmers have been the most affected occupational groups with about 42% and 32%, respectively, also a quite high proportion of about 20% of children and pupils have got infected (Figure 3).

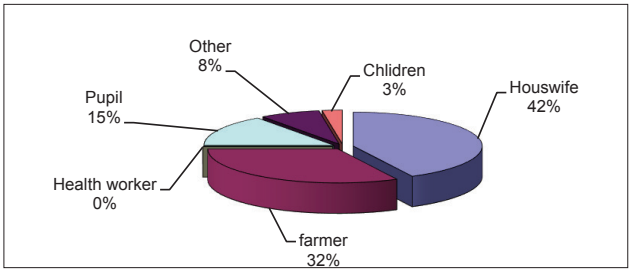

Figure .3. Tularemia cases at Kosovo, 2006-2011, by occupation

The main route of human infection is consumption of no safety water from wells (50%). Another major infection route is through no safety food & water (35%) and 15% only no safety food (Figure 4).

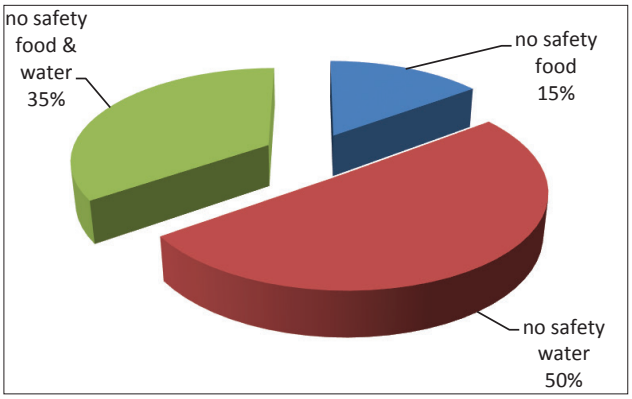

Figure 4. Tularemia cases by route of transmision

5. DISCUSSION

Tularemia is an important zoonosis in Kosovo. The first cases of tularemia in Kosovo were reported in 1999 among civil population in the west part of Kosovo. Tularemia has become an important problem in Kosova after 1999 (4, 7).

The majority of tularemia cases occurred in female in Kosovo with 59% of observed cases while in a study in Central Anatolia region 54.7% were female (5). In Sweden, an overrepresented among males has been attributed to their more frequent outdoor professional and leisure activities (6).

According to WHO Guidelines on Tularemia (6), the age-related incidence rate of tularaemia is unknown, in Kosovo; the infection occurred in different age groups, and peak of cases was found in 20-40 year age group, with 242 cases or 48%.

It was characteristic that people in affected regions reported retrospectively an enormous increase of rodent population, especially field, forest, and domestic mice.

In most countries where tularaemia is endemic, the disease is seasonal; its incidence seems to be highest during late spring, the summer months and early autumn (Olsuiev, 1977; Hayes et al., 2002; Tärnvik et al., 2004) (6).

After two outbreaks (1999, 2001), in following year, only sporadic cases were registered. During 2010 were registered high number of cases (237), but the outbreak was not announced, because here were no epidemiological link between cases.

As almost all patients suffered from the oropharyngeal tularaemia with fever and a unilateral cervical lymph node enlargement as the leading symptoms, obviously the main route of infection was the alimentary ingestion of F. tularensis.

Unsafe food and water seem to be the most likely risk factors for an infection.

Housewives and farmers have been the most affected occupational groups; this is also reflected by the gender distribution as about 59% females were diseased with tularaemia. A proportion of about 20% of children and pupils have got infected. This shows that infection occurs through occupational exposure and farm workers are predominantly men belonging to this age group.

In addition to occupational exposure, an important mode of transmission in Kosovo was consumption of no safety water from wells, and no safety food. Although other infectious diseases may have an even higher impact on public health in Kosovo.

6. CONCLUSION

Kosova is an endemic zone of this disease since 1954 where the first cases were registered. he main reason for ongoing activity of the disease seems to be the still bad sanitary conditions, especially in rural areas of Kosovo.

The case detection is good but a delay of transferring suspected cases could be improved

The large number of tularemia cases and seropositive livestock poses a very serious problem for Kosova.

Tularemia is a zoonosis, so in order to avoid human infections it is very important to implement measures well as perform public health education activities.

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